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International Railway Congress

THE RAILWAYS OF SWITZERLAND

A Railway Gazette publication issued to commemorate the 1947 Congress. It contains interesting articles on the development, nationalisation, electrification, track, running, rolling stock, and maintenance aspects of the Swiss Railways, with many illustrations. Size 12in. × 9in. Paper Cover.

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THE RAILWAY GAZETTE
33, TOTHILL STREET, WESTMINSTER, S.W.1.

Transport Bill Amendments in Lords

THE first two days of the Committee stage in the House of Lords produced several changes in the Transport Bill. On Monday, the Government agreed to increase the membership of the Transport Commission from a Chairman and four members to a Chairman and eight members. It also agreed to discuss at a later stage the position of hotels and refreshment places, and to accept an amendment calling on the Minister of Transport to inform Parliament on appointment, and thereafter annually, of salaries and fees and allowances to members of the Commission. On Tuesday, the Opposition defeated the Government three times. The amendments carried were: the exclusion of docks from the executive management of the Commission; granting to the Commission and not to the Minister. the right to appoint the Executives; and insertion of a provision that the Minister should not give the Commission directions which would involve it in making a loss.

* * * *

F.B.I. and Chambers of Commerce on Taxation

A combined memorandum by the Federation of British Industries and the Association of British Chambers of Commerce carries a good deal of weight because it represents the considered opinion of a major portion of British industry. A document of this category has just been placed before the Chancellor of the Exchequer dealing with the Finance Bill. It criticises the tax on bonus issues of capital, the profits tax, and the provisions relating to retirement benefits; the bonus issues tax as making subject to a duty the mere act of crystallising reserves as capital. The profits tax is assailed because it is borne by the ordinary shareholders, and because it is an undesirable departure from the system of having one tax. Retirement benefits paid by companies are subject to provisions which may result in double taxation—on the provision of the amounts concerned, and when paid to the recipient.

* * * *

The Minister of Transport on Locomotive Shortage

When Mr. Alfred Barnes visited last week the shops of Vickers-Armstrong at Scotswood (Newcastle), which recently have been turned over to locomotive repairs, he commented on the fact that British railways could turn out only 400 of the 700 new locomotives a year they need, and repair only 500 a year of the 3,000 at present out of commission. While that position obtained, they could not carry all the coal, merchandise, and passengers which needed transport. The railways had come out of the war more exhausted than many other industries because of the strain they had undergone during hostilities; he said that this was not always appreciated by the public, nor was it always realised that the railways had gone from war to peace without any break. As well as repairing 10 locomotives a week, the shops at Scotswood were reconditioning some of the 700 austerity locomotives which had been brought back to England from all parts of Europe.

* * * *

Large Order for Locomotives for India

The British locomotive manufacturing industry has received a large order for locomotives for the Indian railways. The contract, which has just been placed by the Indian Store Department on behalf of the Indian Railway Board, is for 300 heavy locomotives of the Pacific type, which are to be built to a new design. The value of the order is estimated conservatively at £6,000,000, and production is scheduled to commence in the autumn of 1949; it is expected that the locomotives will be delivered in India during 1950. The order is one of the largest which the British locomotive industry has received for many years, and production of the locomotives will be undertaken by three of its constituent companies, the North British Locomotive Co. Ltd., of Glasgow, the Vulcan Foundry Limited, of Newton-le-Willows, Lancashire, and Robert Stephenson & Hawthorns Limited, of Darlington.

* * * *

Mr. Morrison on Output Recovery

Mr. Herbert Morrison, Lord President of the Council, told a Press conference last week that British industry had recovered in April and May a good deal of the momentum it lost in February and March as a result of the fuel crisis, but he emphasised that if the holiday period was not to mean a loss of production on the year as a whole, a great effort would

have to be made in the ensuing six weeks. It was essential to resume the greatest flow possible of steel for our metal-using industries at all costs, for unsatisfactory steel production was affecting all production. April output of locomotives, he said, was higher than in February or March, and was on the way back to the average for 1946; wagon production, however, had been disappointing in April. The current issue of the *Monthly Digest of Statistics* gives a total of 39 main-line locomotives produced in March, against 41 in February and 52 in January; the total figure for 1946 was 726. Wagon output in March was 2,972, compared with 2,814 in February and 3,448 in January, the total for 1946 being 39,354

* * * *

Overseas Railway Traffics

A heavy decline of £32.385 on the Central Uruguay Railway in the week ended May 24 was accounted for by a strike on that system. Its effect was felt again in the following week, when traffics were £27.532 behind the previous year, and the aggregate for 48 weeks from July 1, 1946, now shows a decrease of £176,664. The four principal Argentine railways have shown gains in both weeks of the fortnight under review. Central Argentine results were up by ps. 87,685 in the week ended May 24, but only ps. 5,800 were gained in the next seven days. Entre Rios takings were well maintained in the 47th week, showing a gain of ps. 30,500, but lost ps. 900 in the next seven days. Nitrate Railways earnings recorded an improvement of £746 in the fortnight ended May 31, reducing the aggregate deficit compared with 1946 to £2,100. Some results are:—

	No. of week	Weekly traffic	Inc. or dec.	Aggregate traffic	Inc. or dec.
Buenos Ayres & Pacific*	48	2,450	+567	116,627	+7,096
Buenos Ayres Great Southern*...	48	3,696	+896	174,708	+3,915
Buenos Ayres Western*	48	1,569	+299	63,939	+5,978
Central Argentine*	48	3,122	+ 6	154,674	+3,100
		£	£	£	£
Canadian Pacific	21	2,248,250	+381,250	31,090,000	+2,015,500

* Traffic returns in thousands of pesos

Gross earnings of the C.N.R. from January 1 to April 30 totalled £34,073,750, an increase of £3,131,250.

* * * *

The French Railway Strike

A meeting held late at night in Paris on June 10 between the French Premier, M. Ramadier, and representatives of the railwaymen was broken off shortly after midnight, having failed to reach a settlement in the railway strike which had begun on June 6. Train services throughout France are at a standstill, and the Government has organised emergency services by motorcoach to keep passengers moving within the country. Many British tourists in France, held up by the strike, have been evacuated by air in aircraft chartered by the British Government. Others have reached the Channel ports by hiring taxis and lifts in lorries at considerable expense to themselves. The Southern Railway has continued its Continental services on the Dover—Calais and Folkestone—Calais routes, but departures by the Newhaven—Dieppe service were cancelled on June 9. It is now proposed to lift the ban on civilian travel through Germany so that British tourists stranded in Switzerland can be conveyed by special trains to the Hook of Holland. Some have made the 400-mile journey from Basle to Calais by motorcoach.

* * * *

Simplified Goods-Handling on the G.W.R.

In holding a demonstration of goods-handling appliances at Westbourne Park on June 4, the G.W.R. introduced two new types of container developed by the Chief Mechanical Engineer's Department for bulk traffics. These are described in an article on page 632. Both are of 3½ tons capacity, and three can be carried in an open wagon. The covered type is weatherproof, for the conveyance of cement, lime, china clay, and similar materials. Use is being made of this container for transporting cement from the contractor's works to storage accommodation at the site of the new dam being built at Rhayader in connection with the water supply of Birmingham. Both containers have simple and rapid discharge arrangements, and are a major contribution to the reduction of handling costs. In addition to various types of cranes and trucks for handling and stacking goods with the minimum of labour, the G.W.R. showed a new petrol-driven unit of Belgian manufacture for shunting wagons in small yards and private sidings. It is operated and guided by one man, is economical in operation, and is easy to manœuvre into position.

* * * *

Control of Intermediate Sidings

The control of intermediate sidings on double lines often has been the subject of discussion, and many years ago was dealt with in a paper read before the Institution of Civil Engineers by the late Mr. A. W. Szlumper. Various methods have been used from time to time for effecting such control in as economical a manner as possible, including electrical key systems, superimposed on the ordinary block telegraph and combined with electrical locking of the signal controlling the entrance to the section, and special arrangements using lock-and-block equipment for greater security against any momentary forgetfulness. In some cases the siding ground frame has been housed in a small hut with electrical interlocking to control the opening of the door, and, generally, the various railways have had their own views on the suitability of the different arrangements. In this issue we publish a description by Mr. G. H. Crook of a system of control, using instruments designed by himself and adopted with much success at several locations on the G.W.R., to reduce equipment and maintenance costs.

* * * *

Progress of Coal-Oil Conversion

It was stated at a Press conference at the Ministry of Supply on June 3 that, although the steel position still gives rise to anxiety, there are reasonable grounds for hoping that the general position will ease in the last quarter of the year. As already announced, the highest priority has been given to the supply of raw materials and equipment for the heavy electrical and mining industries, and the same priority is accorded to equipment for the coal-oil conversion scheme. The railway programme schedules the completion of 58 ground storage stations by the end of the year, and sufficient material should be available to enable the railways to complete their programme to time, although supplies against the intermediate monthly targets may fall temporarily in arrears. Work on the supply of conversion kits for locomotives is in the main ahead of the ground installations, but the railways have been obliged to design each storage and pumping depot individually to suit local conditions, and for this reason standardisation to a large extent has been impracticable. Orders for oil tanks for locomotive tenders have been undertaken by the Royal Ordnance factories and the Royal Naval Dockyards.

* * * *

Transport Bill Amendments

ON Monday, June 9, the House of Lords began the Committee stage of the Transport Bill with the intention of devoting three days a week to the task. Over 200 amendments have been tabled already, and although a substantial proportion of these are consequential, a reasonable debate on the main amendments is likely to occupy an appreciable time.

On Part I of the Bill amendments have been tabled to enlarge the British Transport Commission to nine or ten persons, of whom the Chairman and not less than five shall be required to devote their whole time to its affairs. To meet objections raised in the House of Commons, the Government is to move an amendment providing that the Commission shall not have power to construct or manufacture anything which is not required for use for purposes of its undertaking, or in fulfilment of a contract made before the Commission acquired the undertaking concerned. The amendment is also designed to prevent the Commission manufacturing substantially more chassis for road vehicles in any period of twelve months than were manufactured by the acquired undertakings in the twelve months before their acquisition. Another amendment extends the limitation to bodies.

Other amendments are intended to restrict the powers of the Minister of Transport in relation to the Commission with regard to capital expenditure, staff education, training, and research: to enable the Commission and not the Minister to take the initiative in regard to the discontinuance of its activities or the disposal of any part of its undertaking; and to ensure that the Minister shall not direct the Commission in any way which will result in its revenue being insufficient to meet its charges, unless he notifies it that he is doing so in the national interest.

With regard to the five Executive bodies, an amendment is being moved to authorise their appointment by the Commission and not the Minister, and other amendments are designed to abolish the proposed Road Executive, to create two Road Executives dealing with goods and passengers respectively, to create a Scottish Transport Executive, to transfer the Inland Waterways from the Docks to the Railway Executive, and to set up the Hotels Executive at the same time as the other bodies. Another amendment is designed to secure that schemes affecting the Executive Bodies should be approved by Parliament and not be left solely to the Minister's discretion.

So far as Part II of the Bill (the acquisition of railway and canal undertakings) is concerned, a new clause is proposed to ensure that persons desiring to make use of the Commission's facilities through a travel agency shall be entitled to do so, and also to ensure that no preferential or differential treatment is accorded to one passenger travel agency compared with another, whether such are vested in the Commission or not.

So far as the compensation clauses are concerned, an amendment is proposed, needless to say not by the Government, providing for an increase of 20 per cent. in the proposed compensation, and another proposes that the British Transport Commission stock to be issued in exchange for railway stock shall be of such amount as will yield interest at a rate equal to the average of the mean of the interest yield obtainable on reasonably comparable Government securities on the dates specified in the Bill. Yet another proposes that the level of the Stock Exchange quotations shall be taken on six days from March to July, 1945, instead of the specified six days in November, 1946. A further amendment provides that any person to whom British Transport Commission stock is issued may require the Commission to purchase it from him at par on any date before January, 1957, and a lengthy Government amendment is proposed to authorise the payment of larger sums to local authorities in respect of the vesting of their undertakings.

With regard to Part III (transport of goods by road), an amendment seeks to withdraw the proposed right of the Commission to acquire road haulage vehicles or road undertakings, and suggests instead the setting up of a Committee of five persons to make recommendations within two years as to the best way of securing an efficient and cheap service of transport by road on terms fair to other forms of transport. Other amendments propose that ordinary long-distance haulage should be regarded as above 80 miles instead of 40, and that the limit which a vehicle can be from its operating centre should be increased from 25 to 50 miles.

A Government amendment proposes that instead of only persons entitled to compensation of less than £2,000 having the right to claim payment of compensation in cash, any person entitled to receive up to £20,000 shall have the right to claim £2,000 in cash. Other amendments are designed to add perishable foodstuffs, milk, films, agricultural products, and dangerous drugs to the list of commodities which are not to be regarded as coming within the definition of ordinary long-distance carriage. The Government also propose an amendment setting out an altered method of paying compensation in cases where a haulier successfully claims that, because of substantial interference with his business, the Commission must acquire it.

So far as Part IV (other forms of transport and port facilities) is concerned, an amendment proposes that the passenger road services provided by the Commission or its agents shall be subject to the provisions of the Road Traffic Act, 1930, so far as it relates to road licences. With regard to harbours, an amendment proposes that as from January 1, 1951, the powers of the Commission to provide port facilities shall cease.

Many amendments are tabled regarding Part V (Charges Schemes). One is designed to ensure that charges schemes covering the whole of the Commission's services are submitted to the Tribunal and not only those which the Minister or Commission desire to submit; two others extend the list of persons who may object to such charges schemes and alterations thereof. Amendments are also tabled to cancel or restrict the Minister's power to exempt the Commission from certain statutory enactments unless he first obtains the approval of Parliament. The restriction of the Minister's transitional power to authorise increases of statutory and exceptional charges is proposed.

In Part VI (finance) a new clause is proposed—not by the Government—providing that each person entitled to receive British Transport Commission stock in exchange for railway or canal stock shall be entitled to receive in addition a British Transport terminable annuity, payable for ten years, equivalent to 1 per cent. of his claim for compensation under the Act. Another amendment is designed to ensure that the accounts of the Commission conform with the best commercial standards and show separately the financial results of each of its activities.

A large number of amendments is proposed to Part VII, which deals with conditions of employment, pensions, and compensation to officers and servants, as the protection afforded is not so good as that given in the Third Schedule to the Railways Act, 1921, at the time of the amalgamations. One amendment provides that the Commission shall not be able to make it a condition of employment that a person must be, or must not be, a member of a particular trade union. Pensions are sought for staff of the National Road Transport Federation and the Road Haulage Association. A very lengthy amendment is proposed—not by the Government—seeking to obtain compensation for loss of employment or worsening of conditions of employment caused to all railway staff employed continuously since November 19, 1945. As to the amount of compensation payable, one amendment proposes that the Minister must issue his regulations as to amounts payable before the date of the vesting, and another seeks to amend the provisions to make them cover passenger road undertakings.

A number of other minor amendments is proposed to Parts VIII and IX of the Bill, and nearly 50 amendments are proposed to the fifteen schedules to the Bill. If the whole of these amendments are to be discussed, it is clear that the House of Lords Committee stage will be somewhat protracted.

* * * *

Transport's Own Club

IN selecting the above title for a short article regarding the formation of the Transportation Club—the successor of the wartime British Railways Transportation Club—we do not think our contemporary, *Motor Transport*, could have chosen a happier or more appropriate heading. As explained in an illustrated article on page 625 of this issue, the Transportation Club has been formed to provide a meeting place for directors and administrative and executive officers of public and private undertakings engaged in or connected with the transport of passengers and goods by land, air, or water, including professions and undertakings germane to the transportation industry; and generally to afford the amenities of a club.

It is strange that this country, the birthplace of railways, never has had a club corresponding to the "traffic clubs" of New York or Chicago. It is true that there have been several clubs and societies, such as the Railway Club, composed mainly of railway enthusiasts. We believe that away back in the days of the "railway mania," the formation of a "railway club" was proposed, but it never materialised. Probably the nearest approach to a railway club in this country was the St. Stephen's Club in the seventies, eighties, and nineties of the nineteenth century. In those days there were few railway general managers, railway solicitors, parliamentary agents, consulting engineers, and public works contractors who were not members, not to mention railway directors. In those happy Victorian days an average House of Commons rarely included less than fifty railway directors amongst its members. The "division bell" rang in the club, and there was a subterranean passage leading to the House of Commons. With few exceptions, the railway chairmen were members of the House of Lords.

As we understand it, the newly formed Transportation Club is not an attempt to revive the tradition of a past era. Though originally sponsored by the four main-line railway companies and the London Passenger Transport Board to afford hospitality to the officers of the Canadian and U.S.A. Transportation Corps, its successor is not intended to be a railway club, but a transport club embracing all forms of transport whether by rail, road, water, or air.

There may be some criticism of the adoption of the word "transportation" instead of the British one of "transport," but we understand that there were certain legal difficulties involved in a change of title. After all, the adoption of "transportation" avoids possible confusion both with the

Ministry of Transport and the Institute of Transport in connection with telephone calls. There are, of course, scores of clubs in London, but the Transportation Club is not an ordinary club. In a lesser degree than the Institute of Transport, it is a quasi-professional body in that the qualification for membership is as set forth in the first paragraph of this article. It may be that in the course of time some form of relationship may be established between the Transportation Club and the Institute of Transport; but be that as it may, we wish the new club every success.

* * * *

East African Railway Reorganisation

THE railways of East Africa, a map of which is reproduced on page 613, comprising the lines of the Kenya & Uganda Railways & Harbours and the Tanganyika Government Railways, for some time have been looked on as suitable for linking. Both are extensive metre-gauge systems. There are 1,625 miles of the Kenya & Uganda Railways, exclusive of the 91 miles between Konza and Lake Magadi, worked by the Administration. The Tanganyika Government Railways have 1,376 miles of line. In our July 6, 1945, issue, we suggested the possibility that some arrangements might be made to link the administrations or to merge them. The resulting system, we pointed out, then would be by far the most extensive in any of the Crown Colonies—a position held now by the Nigerian Railway, which has 1,770 miles of 3 ft. 6 in. and 133 miles of 2 ft. 6 in. gauge lines.

In December, 1945, the Colonial Office published proposals for an inter-territorial organisation in East Africa, and these have been the subject of wide discussion in the East African Territories; more recently, the Governors of the three territories of Kenya, Uganda, and Tanganyika have held consultations with the unofficial members of the Legislative Councils, and as a result, the Colonial Office has published modified proposals as a basis for further discussions.

The revised proposals* envisage an East African High Commission consisting of the officers administering the Governments of Kenya, Uganda, and Tanganyika, an East African Central Assembly, and an Executive Organisation supported in appropriate cases by Inter-Territorial Advisory and Consultative bodies. Among the powers and duties of the High Commission would be that of taking over the functions of the East African Air Transport Authority, the High Commission for Transport, Kenya and Uganda, and the East African Transport Policy Board. When a scheme to amalgamate the Kenya & Uganda Railways & Harbours Administration and the Tanganyika Railways & Port Services has been approved, an East African Transport Advisory Council would be appointed.

The departmental reorganisation envisaged in the proposals suggests a complete amalgamation of the Kenya & Uganda Railways & Harbours Administration and the Tanganyika Railways & Ports Services. The combined administration would have its own capital account and self-contained budget on the lines of the existing arrangements for the Kenya & Uganda Railways & Harbours, and a common establishment of staff. The higher control of these services, subject to the general directions of the High Commission, would form part of the duties of the Member for Transport.

The Member for Transport would be the permanent chairman of the East African Transport Advisory Council for the combined systems, with two sub-committees, one for railways, roads, and inland water services, and one for ports and harbours services. Co-ordination of policy would be secured through the full Council. To function effectively, it is essential that this Council should not be unwieldy, and limitation is proposed to a total of ten members, consisting of the Chairman, two each representing Kenya, Uganda, and Tanganyika, appointed by the officers administering the respective Governments, and three appointed by the High Commission. The composition of the Council would not otherwise be prescribed either in relation to race or as to the numbers of official or unofficial members. The objective would be to secure for the High Commission the most competent advice available.

The annual and supplementary estimates of the services, after amalgamation has been approved, would be submitted to the Central Assembly, which would perform all the functions in relation to them which are performed by a territorial Legislative Council in relation to the annual and supplementary estimates of a territorial department. The relationship between the combined services and other transport would be decided and controlled by the High Commission and the Central Assembly.

The executive management of the amalgamated services would be under the direction of a single General Manager. The technical departments would be combined under one head of department in each case. The General Manager of the combined services would not be a member of the Transport Advisory Council, but he would be invited, together with any other technical officer, to be present at discussions.

The operation of the combined services would follow the existing Order in Council governing the Kenya & Uganda Railways & Harbours, provision being made in the instrument covering the combined services for the interests of the territories concerned to be safeguarded in the event of major changes being proposed in railway alignment. The amalgamated services would be non-profit earning, and surpluses, after working expenditure and proper provision for renewals and reserves had been met, would be applied to the reduction of transport costs to the public. Working expenditure would include provision for the salary and other expenses of the Member for Transport and his staff and for the expenses of the Advisory Council and its sub-committees, allocated between the services in suitable proportions.

Amalgamation would involve a financial adjustment between the two existing systems, but, once the question of higher control and the managerial arrangements had been agreed, it should be possible to find a suitable solution to this problem. It is proposed that a selection should be made in the near future of members designate of the Transport Advisory Council to be appointed as an *ad hoc* committee to draw up a scheme for the amalgamation of the two railway systems and for placing all ports and harbours under unified administration. Before a scheme to this end was applied, it would require the approval of each of the three territorial Legislative Councils, of the High Commission, and of the Secretary of State.

* * * *

The Railways of Switzerland

FOR various reasons the railways of Switzerland are attracting a considerable amount of public interest this summer, principally because Lucerne is the venue of the International Railway Congress from June 23 to 28, and because the Swiss railways themselves are celebrating throughout the summer the Centenary of the opening on August 9, 1847, of the Zurich-Baden Railway, the first entirely on Swiss territory.

For British delegates to the Congress, and indeed for all British railway visitors to Switzerland, the history and development of the Swiss railway system has a peculiarly topical interest at the present time, in view of the experience of the pioneer federal republic in regard to state ownership. Switzerland, it may be recalled, is a Federation of 25 self-governing cantons. It had its origin in a defensive League of 1291, and became formally independent of the Holy Roman Empire in 1648. In 19 of the 25 cantons the German language is spoken by the majority of the inhabitants; the French language in five; and the Italian language in one (Ticino).

So far as concerns the relationship of the State to the railways, the past century may be divided into three periods of approximately 40, 20, and 40 years respectively. During the first, railway enterprise was entirely in private hands, with a minimum of Government control, and with the introduction of a large amount of foreign capital. The second period comprised the two decades of railway nationalisation; and the third one that of State ownership and operation of the principal main-line railway network (today 1,812 route-miles), but with some 1,800 miles of line still in private hands.

The constitution of 1848 gave the Confederation the right to build public works, including railways, but the National Council resolved to support private construction, and on July 28, 1852, the first general railway Law was issued, giving the cantons right to grant concessions. After the opening of the Zurich-Baden Railway, railway construction flagged, and no further lines were opened for more than seven years. Many railway schemes were evolved, and Robert Stephenson was

* "Inter-Territorial Organisation in East Africa—Revised Proposals." Colonial No. 210. H.M. Stationery Office. Price 3d.

asked to submit a plan best suited to the traffic, and to assist in the defence of the country, which he did in 1850. This provided for 400 miles of line, comprising an east-west trunk route from Geneva to Lindau on Lake Constance, with a cross line from Basle to Lucerne and two important branches. The main river valleys were followed, and no crossing of the Alps was proposed. Eventually, all the Stephenson lines were built, and constitute (with minor variations) the nucleus of the system.

The cantons retained until 1872 their right to grant railway concessions, and, during the formative years of the railway system, this resulted in much of the development tending to be local rather than national, and designed primarily for the advantage of the trade of the individual canton. Nevertheless, as the railways were in private hands, commercial considerations caused a considerable amount of linking-up to be effected.

An early tendency towards amalgamation, encouraged by foreign bondholders, caused the principal main-line companies to resolve themselves into five area companies, as follow:—

North-Eastern Railway	1853
Central Railway	1853
United Swiss Railways	1857
Gotthard Railway	1871
Jura-Simplon (a gradual process of amalgamation culminating in	1890)

The first three served the industrial North, from Basle and Berne, through Zurich, to the German and Austrian borders. The Gotthard Railway, promoted as a single enterprise, provided the first trunk route through Switzerland to Italy. What finally became the Jura-Simplon system had a long and involved financial history, and the various railways serving western Switzerland passed through a gradual process of amalgamation culminating in 1890, but never achieving the desired access to Italy under private ownership.

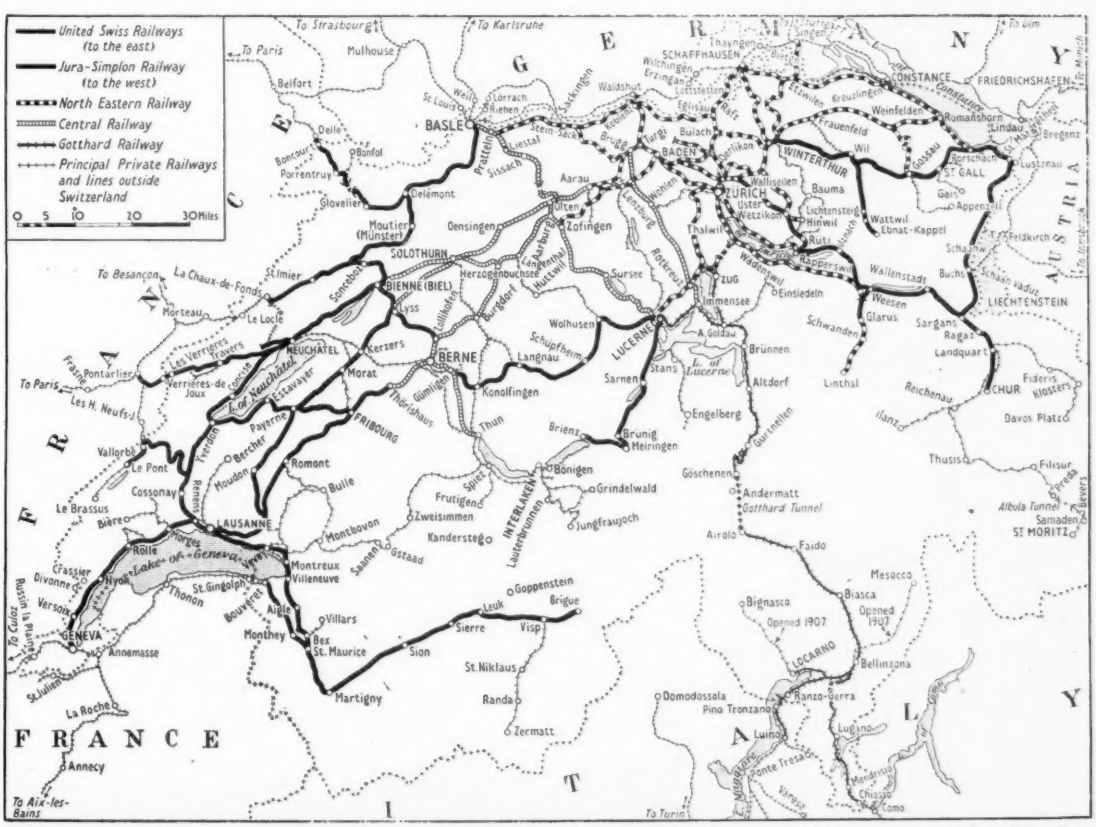
The accompanying map is reproduced from a publication* entitled "The Railways of Switzerland," which has been published by *The Railway Gazette* in connection with the 14th International Railway Congress, and which outlines the salient features of the Swiss railway system.

In early years the Swiss railways were designed to serve purely internal needs, and as they became linked with the railways of neighbouring countries, they tended, by reason of geographical considerations, to become extensions into Switzerland of the railways primarily of the South German States, and secondarily to France. The Alpine tunnels altered the whole complexion of the situation and Switzerland has become the "turntable of Europe" by reason of the international routes through its long tunnels, including the longest in the world.

By reason of the rugged terrain, the railways of Switzerland have always been of substantial construction, and even the many secondary or light railways are far from being light in the sense of having slightly-built track. Good ballast abounds locally, and adequate drainage has been recognised as essential from early days. Many heavy works are involved, including long tunnels and impressive bridges. The flat-bottom rail spiked to transverse wooden sleepers constituted the early track, but the inverted-metal trough sleeper was developed extensively towards the end of last century, and about the period of railway nationalisation some 80 per cent. of the sleepers were iron. Thereafter, wooden ones were often used for relaying, and today some 63 per cent. of the sleepers are metal, and 37 per cent. wood.

The vast programme of electrification undertaken to use the great natural supplies of water power for the generation of electricity has resulted in about 80 per cent. of the Federal railways system being worked by electric traction. Moreover, the electrified system carries some 95 per cent. of the total traffic. Steam-worked sections have been reduced to short branches and secondary lines, but maximum usage from the steam locomotive stock has been secured by rebuilding and improvements. Railcars have been developed in recent years, and important progress has been made in the construction of all-welded lightweight steel rolling stock. These and many other matters are described in the volume.

* "The Railways of Switzerland," published by *The Railway Gazette*, 33, Tothill Street, Westminster, S.W.1. 64 pp. 12 in. × 9 in. 88 photograph illustrations, 12 maps, 19 line drawings. Price 5s.



Sketch map of the railways of Switzerland at the time of nationalisation, some 40 years ago, indicating the five main systems taken over to form the Swiss Federal Railways

LETTERS TO THE EDITOR

The Editor is not responsible for the opinions of correspondents)

Railway Employees' Savings Banks

House of Commons,
London, S.W.1. June 4

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I am asked by Major Legge-Bourke to write to you with reference to the paragraph about railway employees' savings banks which was published in *The Railway Gazette* of May 30.

Since asking his Question in the House of Commons, Major Legge-Bourke has received a letter from the Minister of Transport withdrawing his statement that the unions had been consulted. Mr. Barnes stated that " in fact no discussions with the unions have taken place."

Yours faithfully,
V. E. MOBERLY
Private Secretary to
Major E. A. H. Legge-Bourke, M.P.

British and Canadian Locomotive Prices

Montreal Locomotive Works Limited,
P.O. Box 1350, Place D'Armes,
Montreal. May 20

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In the issue of *The Railway Gazette* of April 4, 1947, on page 325, under the heading " British Locomotive Manufacturing Industry," you refer to a survey of the locomotive industry that has been made recently by Political & Economic Planning.

After commenting on increases in prices in the British industry, the article states: " On the other hand, British export prices are shown to be about 50 per cent. lower than present U.S.A. and Canadian prices," and, again, " The 'XD' locomotive for use on Indian Railways is stated to have been built by Great Britain and Canada for £19,500 and £28,000 respectively."

These statements, insofar as they concern Canadian locomotive prices, are entirely wrong and misleading. This company built a total of 247 locomotives of the " XD " type for the Indian Railways for which the average price, including the cost of knocking-down and packing the locomotives, converted at the standard rate of exchange was under £16,500 and not £28,000 as stated in the article. Of course, the statement that British prices are shown to be approximately 50 per cent. lower is equally wrong. I could prove the point that Canadian prices are highly competitive with any others by reference to bids on foreign inquiries disclosed within the past few months, but I do not wish to labour the matter further.

It is because I know you wish to be exact in any information you publish and would desire to correct any mis-statement that I draw this to your attention.

Yours very truly,
C. F. CARSON,
Vice-President

[As stated in the article, the extracts given were from a survey circulated to the British locomotive industry. The survey was later published in abridged form by P. E. P. and the comparative cost figures were deleted.—Ed., *R.G.*]

Lightweight Traction Motors

5, Yewlands Crescent,
Preston. June 3

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—With reference to the article published in your May 23 issue describing the ultra lightweight traction motors, now being tried out on the Southern Railway, it was stated that the reason roller-type suspension bearings for the motors were not included was because very little experience has been obtained to date with this type of bearing on traction motors running over a system which had the running rail for the return circuit of the current.

I quite agree that there is some considerable danger of premature failure with bearings of this type, even though they might use earthing brushes rubbing on the axles, as the path for the current through such a brush is only a path in parallel with that through the roller bearings, and more often than not this path is of low resistance, and even in the absence of fault currents, ordinary currents of the order of 100 amperes, over a period of a year or two, could cause this bearing to fail, whilst a heavy fault current can cause immediate pitting of the rollers.

However, some years ago the firm with which the present writer is associated decided to fit roller-type suspension bearings on traction motors running on a system which had the running rail for the return circuit, and we naturally realised the dangers to which we should expose this bearing unless special precautions were taken, so we evolved an insulated type of brush for carrying the return current safely to the axle. We felt at the time that as each vehicle had a plurality of motors, it was perfectly safe, and events over these last eight years have proved this.

Briefly, the brass casting which carries the brush is fitted to the motor casting, but insulated from it. The return of all circuits on the vehicle, including the traction motor current and auxiliary currents, comes to a main negative terminal on the under-frame of the vehicle; this negative terminal is again insulated and from here cables run to the terminal on the insulated negative-return brushes. By this means we ensured that all return current passed *via* these brushes.

In the writer's opinion there have been many cases of the roller armature bearing of traction motors failing due to passage of return current through them, this current passing from the motor frame *via* the armature bearing to the armature shaft and from there *via* gear teeth to the axle, and on one particular transport undertaking we were able to effect a reduction in such bearing failures by suitable return-circuit connections.

Yours faithfully,
H. CHARNLEY

Deterioration of Postal Services

70, Rowlands Avenue,
Hatch End,
Middlesex. June 9.

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The editorial article in your May 16 issue on the deterioration of postal services in Great Britain was timely, and few will be disposed to dispute the justice of your contention.

On Friday evening last we were solemnly assured in the House of Commons by the Assistant Postmaster-General that letters catching the last evening post are delivered in any part of England, except very remote districts, the next morning.

This morning, June 9, I have received one letter bearing the London S.W.1 3.45 p.m. postmark of June 6 (three days previously and not even the last collection of the day), one letter postmarked 4.30 p.m. at Corby, Northants, on June 6, and two more communications posted in London with the last collection on June 6.

The previous week-end a clearly addressed envelope from your office containing urgent proofs, postmarked 6.15 p.m. in Westminster on May 30, was delivered to me, with two other communications posted at the same time, on the morning of June 2, and a fourth London letter with a May 30 postmark came with the second post on June 2. Most of these letters had thus taken three days to travel from London to an addressee in Pinner, Middlesex, less than 15 miles away. In this " very remote district " of the British Isles, the last collection of the day at our neighbouring pillarbox is 5.15 p.m., but one hesitates to entrust to it anything urgent for the first delivery in London on the next day.

Yours faithfully,
CECIL J. ALLEN

SWISS RAILWAY BRIDGE DAMAGED BY EARTH MOVEMENTS.—Damage caused to a recently-built railway bridge by the pressure of slow-moving mountain masses has led to interesting geological and engineering investigations in Switzerland. The bridge, over the Landquart River near Klosters, which carries the Rhætian Railway to Davos in a sharp curve of 6-ch. radius, was erected in 1930 and is an elegant structure of reinforced concrete. Measurements taken in 1938 revealed a number of fissures in the structure, and specialist engineers from the Federal Technical College at Zürich were called in to report on the causes, and to suggest remedies. Thorough geological investigations, which included measurements of earth pressure in the adjoining railway tunnel, revealed a slow but steady movement of the mountain masses on the left side of the river, whilst the right bank abutment was hardly affected. As it would have been hopeless to try and halt the earth movement, it was decided to strengthen the right bank abutment and to connect it with the one on the opposite bank by means of a horizontal bar, which would transfer the horizontal pressure into the more solid soil on the right bank and keep the left bank abutment " floating " on top of the slowly moving soil. This reconstruction work was carried out, without disturbance to traffic, in the course of one year.

The Scrap Heap

Seaside Streamliners

Southend Corporation is to buy four streamline trains for its pier railway at a total cost of about £99,100.—*From "The Daily Telegraph."*

* * *

"No" to State Transport

The British Institute of Public Opinion, after a nation-wide poll, say that all Britain, except Wales and one Midland industrial area, opposes road transport nationalisation. The Institute claim that its "scientific" poll shows that the nationalisation opponents outnumber Government policy supporters by 1,500,000.

Lancashire—308,000 General Election Labour majority over Conservatives—had 273,000 votes against road transport nationalisation. Wales had a 50 per cent. for, 50 per cent. against poll.—*From "The Liverpool Daily Post."*

* * *

"Russianising" British Railways

I should like to touch upon the proposal to "Russianise" the transport system of Great Britain. I suppose that "Socialise" would be a softer word. But I think the word "Russianise" expresses more accurately what it is intended to accomplish. . .

Some of the Labour members of Parliament reported that their constituents thought that nothing should be paid to the owners of the British railways. You will thus see that some of the British Socialists have already learned a lesson or two from their Russian brothers. . .

What is the real reason lying back of this Bill to "Russianise" the British railways? It simply reflects doctrinaire dogmas of the British Trades Union Congress. It is a part of their programme; therefore, irrespective of whether the public will benefit, it must be carried out.—*Extracts from an address to the Trans-Missouri-Kansas Regional Advisory Board by Elmer H. Smith, Senior General Attorney, Illinois Central System.*

* * *

Getting Around

Research by the Union Pacific Railroad into the movements of one of its bogie box wagons over a period of four and a half years has revealed some surprising facts.

The wagon, No. 193346, selected at random, was handled during this period by 83 different railways. On an average, it changed hands in this way 221 times in all, or once every 7¼ days, for it passed through the hands of some of the railways anything up to ten times. In its travels, the wagon had been in every State of the U.S.A. at least once, as well as into several provinces of Canada; also, it had been to or through every major United States city. It had been used to carry all conceivable commodities from canned peas to boxes of ammunition.

* * *

Sleepers' Guide

May I suggest to the railway companies that occupants of sleeping berths be invited to record, on a card prepared for the purpose, the whereabouts of the squeaks and groans, rattles and jingles which are becoming increasingly evident with the ageing of rolling stock? A mechanic guided to the offending bolt or door-knob by the directions on the card could effect lasting repairs in a fraction of the time taken by the most experienced traveller with his matchsticks, string and india-rubber. It is tragic when the illusion of pre-war luxury is shattered by a groaning washbasin cover.—*Mr. Ian Hunter in a letter to "The Times."*

* * *

100 YEARS AGO

From The Railway Times, *June 5*, 1847

EASTERN COUNTIES' RAILWAY.—REQUIRED for this Company, 5 TRAVELLING CRANES, 500 tons of RAILWAY CHAIRS, 60 tons WROUGHT IRON SPIKES, 70,000 WOODEN KEYS, according to samples, information respecting which can be obtained at the office of Mr. Samuel, the Resident Engineer of the Company, at this Station.

Tenders, addressed on the envelope "Tender for ——," are to be forwarded to this office on or before Tuesday, the 25th instant. The Company do not bind themselves to accept the lowest tender.

By order,
C. P. RONEY, Secretary.

Bishopsgate Station, June 10th, 1847.

* * *

Travel

Many of the holiday travel hardships, this summer, will be no one's fault. They will be aggravated by the 10 per cent. cut in train services, imposed by the Government to save coal. The saving will be small compared with the resulting weariness and irritation, the time wasted in queues and crowds. But even without the cut the holiday rush would have set the railways an impossible task. Repairs and renewals have been held up by lack of labour and materials and 6,000 fewer coaches are in service than there were before the war. . . .

Part of the trouble is that we are reluctant to face the habit-shaking demands of this democratic age. The need for new holiday arrangements is one small facet of a much wider problem. Throughout the long centuries of history, until quite recently, societies were based on class divisions; there was always a privileged class, and for it most of the luxuries and many of the amenities of life were reserved. Now we are opening the doors and saying that the passports of inherited rank and wealth shall no longer be required. This is a revolution, however quietly it may proceed; and we have hardly yet begun to measure its full range. . . .

The railways say that they have had to suspend seat bookings because reserved seats are invaded and the labels torn down. Perhaps the invaders have a vague feeling that to reserve anything is undemocratic—why not the simple rule of first come, first served? It would be undemocratic if seats could be reserved only by members of some privileged class, but it is perfectly fair that anyone who has had the foresight and taken the trouble to book a seat should enjoy the advantage of it. To make seat booking impossible results merely in a general scramble, with the prizes going to the selfish and the strong.—*From "The Observer."*

* * *

N.U.T.S.

Lord Balfour of Burleigh (Tory) said during a debate on the Transport Bill in the Lords: "I hope that the Transport Commission will call itself the National United Transport Services. Its initials will not only look good on an engine; they will provide a one-word epitome of what I think of this Bill."—*From the "Daily Express."*

* * *

A Tribute to George Stephenson

A bunch of flowers was found placed at the foot of the statue of George Stephenson in the Great Hall of Euston Station, L.M.S.R., on June 9. Attached to it was a typewritten note bearing the following inscription: "In grateful memory of a great man on the anniversary of his birth—from a passenger." George Stephenson was born on June 9, 1781.

* * *

New Aristocracy

By what right does the Government continue to refuse to disclose the salaries and other privileges enjoyed by many of its State servants employed on public board ?

The public provides the money and is entitled to know.

Even more important is the question of the privileges.

What expense allowances do they receive? In these days of high taxation this is often the most lucrative part of the remuneration, being tax free.

On top of all this there are free cars and free houses.

The Socialists are creating the greatest and most powerful privileged aristocracy since the days of George the Fourth.—*"Cross-Bench" in "The Sunday Express."*

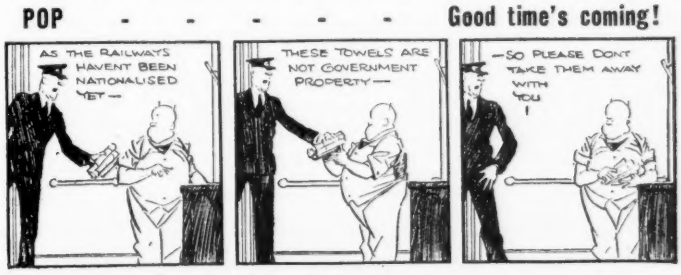
* * *

Incentive Increases Production

Early in April, your management had a team conference, and agreed that, in spite of war weariness, food shortages, austerity, and general malaise, a greater production effort could be made.

A monthly turnover sufficient to cover overall commitments was agreed. This was called the datum line. It was decided that a dividend of a specified amount in the £ on gross wages should be paid to all employees in accordance with the percentage by which the actual turnover in any month exceeded the datum line.

The first employees' dividend was paid in May; in October the dividend was nine times as large as that of May. The output in October was a record one for the company. The incentive had worked; the turnover for 1946 was a peacetime record. —*Mr. R. H. Roberts at the annual general meeting of Super Oil Seals & Gaskets Limited.*


POP - - - - - Good time's coming!
AS THE RAILWAYS HAVENT BEEN NATIONALISED YET —
THESE TOWELS ARE NOT GOVERNMENT PROPERTY —
— SO PLEASE DONT TAKE THEM AWAY WITH YOU !

When the public owns the railways

[*From the "Daily Graphic"*

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Better Services to Coast

Some of the coaches of the Royal Train, after being converted for general passenger use, will be used as the nucleus of a fast air-conditioned luxury train to run between Johannesburg and Durban (see *The Railway Gazette* of May 2). Some of the remaining coaches will be retained for use by the Governor-General.

The administration proposes, within a matter of months, and subject to the approval of the Central Transportation Board, to introduce a luxury bus service between Durban and Johannesburg. Vehicles are on order. It is intended to co-ordinate this service with connecting routes, and also to use the buses for picking up passengers at stations along the route where the train times are inconvenient.

Shortage of Equipment

The rolling stock position is still critical. During the war, orders for more rolling stock and motive power were placed locally and overseas, but many orders have not been fulfilled so far. The present programme provides for 32,000 short wagons of local and overseas manufacture, 316 steam locomotives, and 68 electric units. An order for an additional 4,000 short wagons is to be placed soon. Of one order for 100 heavy locomotives, a number will be in service shortly, and early next year it is hoped that deliveries will begin of another 150 lighter branch-line engines.

The world shortage of steel, coupled with overseas labour difficulties and sea transport problems, has been responsible for delays in the delivery of much of the stock already ordered. Delivery of electric locomotives is more than a year behind schedule, and of one order for 28 units, only one has been placed in service.

RHODESIA

Improved Sinoia Branch Service

The thrice-weekly mixed-train service which for many years was operated on the branch from Salisbury to Sinoia has been replaced by a passenger train running daily except Sundays. The time for the journey is now 4 hr. 10 min., as against over 7 hr. by the mixed train. In due course, the administration intends to replace the steam services both on the Sinoia and Shamva branches from Salisbury by diesel railcars, but some difficulty is being experienced in obtaining suitable vehicles.

Saving Cattle in Drought

Exceptionally dry weather early this year made the removal of cattle from drought areas a matter of urgency. The Rhodesia Railways were asked to run from five to eight trains daily for this purpose, and in spite of the shortage of rolling stock, the administration concentrated some 400 cattle wagons in the Bulawayo and Gwelo areas within four days of the request being made.

The first trainload of cattle from the drought areas was run from Bulawayo to Salisbury on February 18, and six more were operated on the four following days. At one point a temporary offloading bank had to be constructed, as the existing accommodation enabled only one wagon to be dealt with at a time. When this bank was completed, a trainload of 14 bogie wagons was offloaded in 45 min. Some of the movement took place from the Marula-Figtree district, south of Bulawayo, where the line is worked by the South African Railways. To provide for the additional services, therefore, two train crews had to be transferred temporarily from Mafeking to Bulawayo.

Up to February 28, the administration ran 21 special cattle trains, conveying approximately 6,550 head of livestock. The demand for cattle movement did not quite come up to the level envisaged, so that there was a surplus of rolling stock, and in some cases wagons used for moving cattle were forwarded to another point for loading with coal before return. Half-rates were granted on both forward and return journeys for the conveyance of livestock between the drought areas and new pasturage.

INDIA

Surma Express Derailed

Thirty persons were killed and 61 injured when 516 down Surma express was derailed on May 17 between Kamalasagar and Nayanpur stations, on the Laksham—Comilla—Akhura metre-gauge section of the Bengal Assam Railway. The engine and nine bogies of the train overturned. Three relief trains carrying railway officials and medical equipment were sent to the scene of the accident. The cause of the derailment is under investigation.

Railways Inquiry Committee

The Indian Railways Inquiry Committee, which began its sitting in Delhi on April 24 under the chairmanship of Mr. K. C. Neogy, is continuing its work in Simla. It is making a preliminary study of reports on all aspects of railway working, and statistical and other information supplied specially. The committee is likely to discuss the revision of railway rates with railway officers at Simla.

After holding further sittings in Simla, the commission is expected to start towards the end of June or the beginning of July on a tour of three months, during which all the important railway centres in India will be visited. Apart from railways under the direct administration of the Railway Board, the commission is likely, at the request of the Hyderabad, Mysore, and Jodhpur Governments, to inquire into the administration of their railway systems.

Responsibility for Lost Goods

The rights and responsibilities of the Railway Department as a public carrier was discussed in detail by Mr. U. N. Misra, Munsif of Berhampur, in a 27-page judgment decreeing a plaintiff's claim against the Governor-General-in-Council, representing the three State Railways concerned (B.-N.R., E.I.R., and O.T.R.).

A perfumer of Behrampur had sued the Government, as the representative of the three railways, for goods lost during transit. The railways claimed exemption under a risk note usually executed by the consignor. The court held that the risk note was not proved, and that even if it had been proved, "non-delivery is not coextensive with loss, destruction or deterioration" contained therein.

Mr. Misra observed that the defence set up by the defendant companies was most unsatisfactory, and not worthy of their position as carriers.

Increased Penalties for Railway Offences

The prevalence of crimes such as molestation of passengers and the theft of passengers' belongings in trains has been causing the Railway Board and the railway administrations great concern. Railway administrations have issued orders to their train examining staff that all catches and bolts of doors and windows are to be checked and put in proper working order before a train leaves a terminal station. As a further measure of protection, railways have been directed that as coaching stock passes through shops for periodic overhaul, the windows of lavatory compartments are to be fitted with iron bars. Other measures that have been taken include the posting of armed guards on trains running on certain sections, and an increase in the Watch & Ward staff provided for the protection of railway passengers. In certain provinces, where, owing to disturbed conditions lawlessness is prevalent, an armed force of special protection police has been formed. Special Watch & Ward staff now travel on a number of passenger trains, and are given the specific duty of keeping watch on compartments reserved for women.

Other crimes, like sabotage, banditry, and the stopping of trains for lawless purposes, which endanger the life and property of passengers, are punishable by death under Ordinance XXVIII of 1946. Under this Ordinance, which was promulgated last December, the stopping of trains by pulling the communication cord for any unjustifiable purpose is punishable by imprisonment for a year or a fine of Rs. 500, or both. Penalties which ranged from fines of Rs. 50 to imprisonment for two years before its promulgation, now have been increased to fines of Rs. 500, transportation for seven years or for life, and capital punishment in serious cases.

UNITED STATES

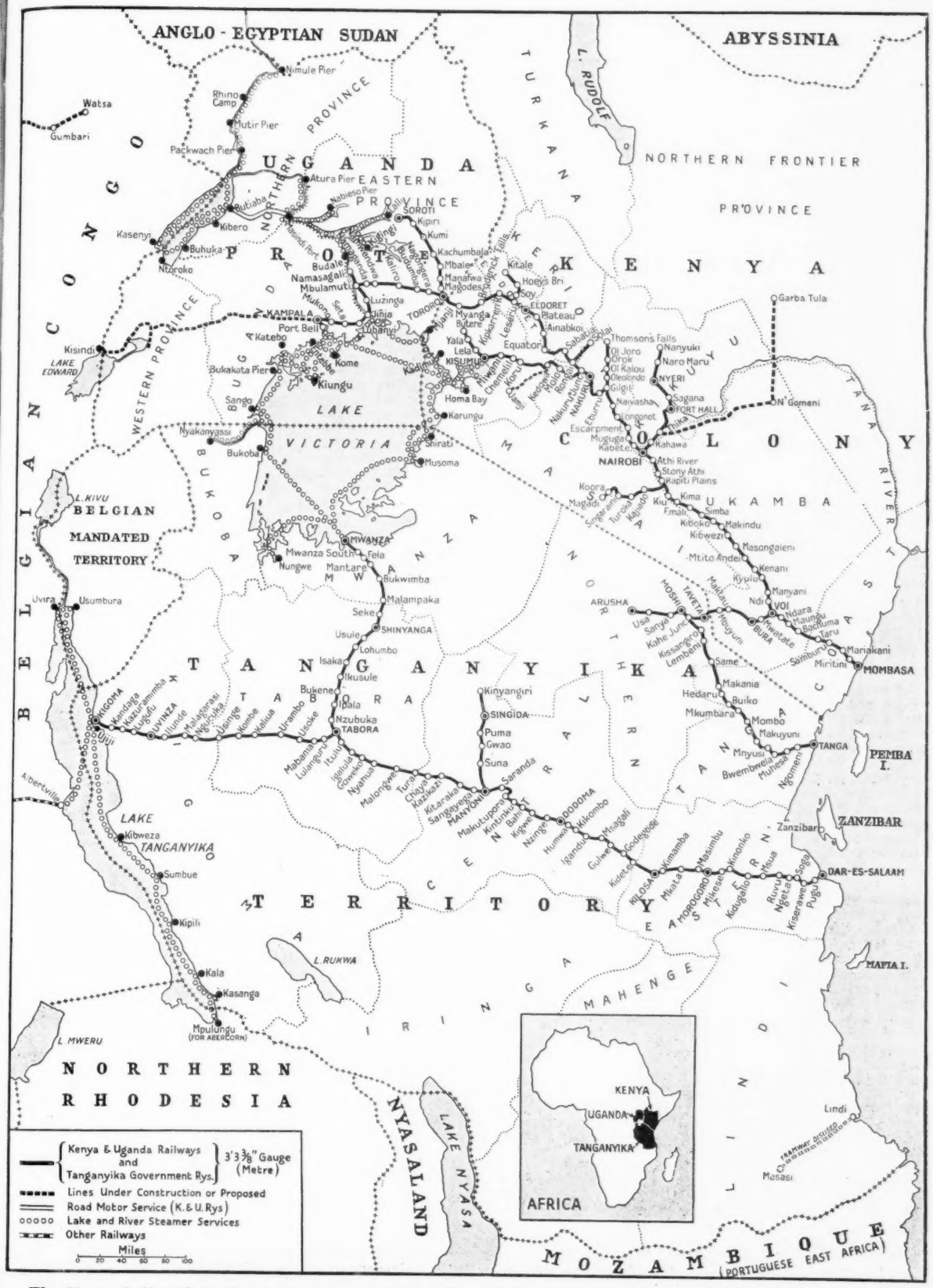
Season Tickets by Post

For the convenience of season-ticket holders and other regular travellers in the New Jersey area, the Delaware, Lackawanna & Western has introduced mail order forms for the purchase of such tickets. The form, accompanied by a cheque for the appropriate amount, is posted to the issuing station, from which the ticket is sent to the customer by mail. Forms are available at all the company's suburban ticket offices.

Passenger Service Improvements

Several improvements in long-distance passenger services came into force on April 27, the date on which Daylight Saving Time was introduced. The Chicago & North Western and the Union Pacific now operate the "City of Los Angeles" daily between Chicago and Los Angeles, instead of three times a week. Another through service between Chicago and Los Angeles is provided by the new daily train, the "Grand Canyon," which operates on a schedule of 48 hr. 45 min., as compared with 46 hr. 30 min. westbound, and 46 hr. eastbound by the "Chief" streamliner.

The Illinois Central is working a new streamline train, the "City of New Orleans," between Chicago and New Orleans on a 15-hr. 55-min. schedule. This makes it possible for the first time to make the journey between these points by rail in a single day.



The Kenya & Uganda Railways & Harbours and the Tanganyika Government Railways, which it is proposed should be brought under a common administration *(see article on page 608)*

Lightening Rolling Stock

A summary of the methods of reducing dead-weight dealt with before the International Railway Congress Association

AMONG the matters for discussion at the International Railway Congress Association at Lucerne are three reports covering the different methods now being used in various countries to achieve lighter rolling stock. The reports cover world practice as follows: a report by Mr. E. A. W. Turbett, Assistant Chief Mechanical Engineer, Southern Railway, summarises answers to questionnaires sent to the four main-line railway companies and the London Passenger Transport Board in Great Britain, five American railways, and railways in India, Ceylon, Iraq, New Zealand, Kenya, and Sudan. Another report covers the methods adopted throughout Continental Europe (except Russia, Germany, and Austria) and in the colonies of France, Belgium, Holland, and Portugal. This report is compiled by Monsieur R. Guignard, Engineer, Motive Power & Works Division of the Swiss Federal Railways Administration. Thirdly, Monsieur W. A. Vrielynck, Director of Motive Power & Rolling Stock of the National Light Railway Society, in Belgium, has contributed a report devoted particularly to the trends in lightweight rolling-stock design and construction on representative light railways of all countries.

The most important fact emerging from this survey is a general admission from the managements of practically all the railways that it was necessary to aim at lighter rolling stock, and, further, it was generally agreed that this was feasible.

Weight Reduction by Welding

Electric welding, which began to replace rivets in constructional work during 1930-35, has enabled the dead-weight of main-line coaches to be reduced by some 10 per cent. The L.M.S.R. and L.N.E.R. have given a valuable lead here, accompanied by the L.P.T.B., on all of which lines it is now accepted practice. France, Italy, and Switzerland have developed the tubular girder form of construction which, with the use of light alloys, has permittted a further notable reduction in weight.

The use of special steels or of lightweight materials having an aluminium or magnesium base was recognised as bringing difficulties with it; with the former materials, welding troubles exist, and in the latter, high cost and the need for heavier scantlings (due to the lower modulus of elasticity of the alloys) largely nullified any advantage they might have offered. Ordinary mild steel, therefore, has appeared to be the most promising constructional material. The chief progress in the use of special high-tensile or rustless steels has been made in America; aluminium, too, has been used there for underframe members. For light railways there has been a definite tendency to permit a stressed body framework, to take some of the stresses normally borne by the underframe alone. In such cases, the solebars, body pillars, transoms, and framework all are made as components of a trellis girder.

Further savings in weight can be effected by reducing the thickness of the plates used as sheathing. Mr. Turbett's report, which is concerned largely with British and Dominions practice, shows steel panels of 16 s.w.g. to be in common use; the Americans have occasionally used aluminium. With thinner sheathing, corrosion assumes a special importance; copper-steel plate has been tried, but generally a coat of lead paint is applied, with flock on the inside surfaces. The flock also gives insulation against the effects of heat, cold, and noise, and tends to damp out vibration. For Continental freight services aluminium has been used recently for the side panels and doors and (in Hungary) for the brakesman's shelter. On Belgian light railways, aluminium-magnesium alloy is used for railcars; the sheets are 2 mm. thick, and a square metre weighs 12 lb.

Design of Bogies

Bogie design has proved to be a fruitful field for weight reduction. Three main directions in which this has been achieved are : the shortening of the bogie wheelbase; the use of hollow axles; and the use of pressed or bent platework assembled by electric welding for the frames and bolster. Hollow axles are understood to have originated in the U.S.A., and have been proposed for future 36 in. diameter wheels on the Great Indian Peninsula Railway. On light railways, their use seems to be confined to the Zürich Municipal Tramways. As to the type of framing, British practice favours bolster swing-link suspension, with springs over the axleboxes. Fabricated bogie frames are favoured widely, and are adopted as modern practice on the L.M.S.R. and L.P.T.B. in Great Britain, and on the New Zealand Government Railways. The French National Railways, using what is virtually the Pennsylvania type of bogie, have succeeded in cutting the weight down to 10,802 lb., and the Swiss Federal Railways have obtained savings of 40 per cent. in weight. In the latest design for Belgian light railways, the bogie frame, instead of being (as formerly) a single block of cast steel weighing 1,332 lb., now weighs only 1,014 lb., and is made up of solebars with horizontal and vertical ribs of 10 mm. ($\frac{3}{8}$-in.) plates assembled by arc welding. The two solebars are stayed by four cross-beams of channel steel. The bolster, of cast steel, which weighed 272 lb. without the shoes in former designs, has been reduced to 237 lb.

Regarding axleboxes and spring gear, solid or divided type axleboxes are mostly used, with the half-bearing. Roller bearings have been used on certain lines as an experiment, and on many systems—the L.P.T.B., and railways in the U.S.A., Ceylon, New Zealand, and Iraq—they are adopted generally as modern practice in passenger vehicles. On the Kenya & Uganda Railways they have been used experimentally on freight vehicles. The use of cast iron or cast steel is divided about equally.

The L.P.T.B. and the Ceylon Government Railway have had experience of fabricated construction for axleboxes on passenger stock; and the L.M.S.R. and L.N.E.R. have tried this method for axleboxes for goods wagons. Light-alloy axleboxes with steel keeps weighing 66 lb. each are in use on Belgian National Railways freight stock. Springs are most often arranged in two groups between the bolster and the axlebox in combinations of helical, volute, elliptic, or half-elliptic patterns.

Drawgear and buffing gear perhaps may be considered together for convenience. Opinions at present seem to be divided equally between side buffers (with hook drawgear) and centre couplers in the countries covered by Mr. Turbett. Similarly, rubber springs seem to be favoured as much as steel springs. Generally, the feeling about self-contained buffers seems to be that they weigh less than buffers with springs behind the headstocks. Special high-tensile steels are favoured for drawgear in the U.S.A. On the New Zealand Government Railways, buffer heads are electrically butt-welded to the main shank. The large degree of standardisation of many drawgear and buffing components on the Continent has militated against any systematic attempt to lighten their components. On certain Belgian light railways, railcar buffing gear has been lightened by simplifying the buffing spring support. The new support consists of a block of wood, with a circle of iron clamped on at its ends, which is used as the housing for the large base of the spring. The other end of the spring presses directly on the buffer beam.

In new lightweight railcars and trailer cars now being designed, the bumpers protecting the platform solebars are arranged in front of the leading headstock, with a safety joint in the details forming supports for the buffing gear.

An interesting design of light, but very rigid, type of headstock recently standardised for new freight rolling stock in France is of box form and carries the drawgear. The ends of the solebars, the headstock plate proper, the first intermediate member, and the two buffing struts comprise a completely welded unit.

Brake Gear

Brake gear has been lightened considerably by the adoption of pressed-steel brake cylinders in place of cast iron. In the U.S.A. aluminium brake cylinders are beginning to appear. High-tensile steels are used for the foundation brake rigging in the U.S.A. All British railways have adopted the electric welding of levers to brakeshafts and fulcrum brackets for freight stock.

On light railways in Belgium, an attempt has been made to re-design brake cylinders for railcars, so as to reduce the secondary forces. The brackets to which the cylinders are attached are at the centre line of the cylinders and are carried on the solebars of the underframe. The weight of brake cylinders has been reduced from 110 lb. to 81 lb. The centre line of the brake bellcrank lever coincides with that of the levers transmitting the brake force to the bogies. In standard construction this lever consists of a double "bayonet," which gives rise to a large bending moment, and necessitates a large weight of metal if high stresses are to be avoided.

As regards interior fittings in passenger stock, small but definite savings in weight are to be gained from the use of thin plywood or aluminium plate for filling the walls of the vehicle, light alloys for the luggage racks, doors, and window frames, and steel tubing for the frames of the seats and the compartment partitions.

In freight stock, a reduction in the weight of covered wagons can be effected (as on the Swiss Federal Railways) by the use of aluminium alloy for the roofing. It has the further advantage of a reduced cost of upkeep, compared with the impregnated canvas which it replaced.

Railcars and rolling stock for light railways can be lightened (in addition to the methods already mentioned) by the omission of interior partitions, and by forming the ceiling and interior panelling of compressed cardboard or plywood.

Types of Sleepers and Sleeper Maintenance

A questionnaire for the 14th International Railway Congress, 1947, has brought instructive replies

MR. J. C. L. TRAIN, Chief Engineer, L.N.E.R., is the reporter for America, Great Britain, India, Dominions, Protectorates and Colonies, China and Egypt, to the forthcoming 14th Session at Lucerne of the International Railway Congress Association on the question of sleepers. His report was published in the January, 1947, issue of the Congress *Bulletin* and covers the views expressed in the replies received from 24 managements out of the 45, to which he had addressed a comprehensive questionnaire.

The length of track covered by the report is 121,310 miles and has been classified into (*a*) lines with speeds of 60 m.p.h. or over, or carrying trains weighing more than 1,000 tons; (*b*) lines with speeds of from 40 to 60 m.p.h., or carrying trains weighing more than 500 tons; (*c*) running lines not included in (*a*) and (*b*); (*d*) sidings and other non-running lines.

Types of Sleepers

No new material has been found that will take the place of timber, steel, or concrete for sleepers, and the only alternative is still the cast-iron pot sleeper so well known in India. Continuous timber beams, or longitudinals, are met with chiefly on viaducts and on certain underground railway sections.

A section of continuous concrete beam track is on trial on the L.N.E.R., in an endeavour to develop a type of track requiring the minimum of maintenance and inspection, especially in tunnels. The rail is 110 lb., flat bottom, fastened by clip and mushroom-head bolts to cast-iron inserts in the concrete beams which rest either on a bituminous concrete raft or on two strips of aluminous cement concrete. The same railway reports an experimental section of steel beam track, with 75 lb. flat-bottom rail welded to inverted square U girders. On a length put in 2½ years ago the welding is beginning to show signs of failing.

The Southern Railway has continuous timber beams laid on concrete in the Waterloo & City tube and reports that track circuiting functions there satisfactorily. It is thought that plain concrete beam track would not allow of that.

Local conditions vary so widely throughout the large area covered by Mr. Train's report that it is difficult to harmonise some of the replies with one another and impossible to lay down any rule regarding size, material, or treatment of sleepers, but the following conclusions are put forward as covering the position broadly; (1) no reasonable alternative has been found to the cross-tie or sleeper; (2) timber is still preferred almost universally.

About one third of the railways approached apply a preservation process to the wood. About 2,100 to 2,400 sleepers a mile generally are thought adequate where maximum axle load is about 22 tons; but with the heavier loads met with in North America about 1,000 more per mile are needed. Most lines do not use extra sleepers on curves. Length of sleeper is thought to exercise definite influence on track stability and 8 ft. 6 in. to be about the minimum for standard 4 ft. 8½ in. gauge Width also affects stability, laterally and longitudinally. Sleepers usually are deeper in North America than elsewhere, again in consequence of the heavy axle loads. A great variety of timber is mentioned in the report, according to the resources available in each country. One railway only, it appears, lays its sleepers heart down, but it is thought that life is not much affected by this. The general rule is to allow limited wane on two edges and strictly to limit boxed hearts. Seasoning usually is carried out in the air, but a case of the use of drying kilns was reported.

Mechanical wear is the chief factor in destroying sleepers, but some lines give decay as contributory where sleepers are not treated. The treatment does not affect the electrical resistance properties. It is usually carried out by the railways at their own depots, pressures and temperatures being recorded. Split sleepers are repaired by applying S irons by most of the railways, but the number of lines who do not do this is, Mr. Train found, surprisingly large. There is usually a system of grading sleepers taken out of service in running lines, but practice varies considerably and no standard arrangement can be laid down. Dog spikes are the most widely used fastening, but at the same time spring spikes are becoming more popular. All types of ballast are suitable for use with wooden sleepers.

Steel Sleepers

One railway, the Kenya & Uganda, reports that it uses steel sleepers exclusively. No standard in regard to either shape or the sizes of steel sleepers can be laid down. Hook bolts and clips appear to be the usual method of fastening for flat-bottom rails on steel sleepers, and outside Great Britain it is the exception to fix baseplates or chairs to such sleepers. It is not considered that undue wear takes place due to grit and water where the bolts project through to the underside of the sleepers. Most of the sleepers begin to fail from corrosion followed by cracks around the baseplate or chair seat; there is a definite use for steel sleepers, however, in the majority of cases when finished within the track. It has not proved possible to adopt track circuiting with steel sleepers.

Concrete Sleepers

Only the British railways report using pre-stressed concrete sleepers, and one of them has carried out stress reversal tests, the results of which are shortly to be published. The South Indian Railway reports the very interesting fact of using concrete sleepers on track-circuited sections. No part of the metallic fixtures is nearer to the bottom of the block than ½ in. All recesses into which bolts are fixed are plugged at the bottom with bitumen of minimum depth of ½ in. and flush with the bottom of the sleeper. Granite stone ballast is specified in this case.

It seems correct that large ballast should not be used with concrete sleepers as it sets up high load stresses. The only use for old or recovered sleepers is as paving or flooring. As regards failures, four railways report that none has been experienced with the pre-stressed pattern, but it has not been in use for any length of time. These and two other lines say that normally re-inforced sleepers fail through cracking, with ultimate exposure of the re-inforcement. No railway uses power tools when packing concrete sleepers.

The most popular form of packing is by hand beater, with shovel packing second and machine packing third, for both timber and steel sleepers. Worn holes in the former are most commonly repaired with wooden plugs. There is a limited amount of repair welding of steel sleepers in the track, but no repairs to concrete sleepers are reported. There is no conclusion as to where the top of the ballast should finish.

In Great Britain the common practice is to renew all sleepers at once on a given section, but elsewhere the "spot" method usually is followed. A few lines repair sleepers in the track, using end clamps, dog spikes, and screw dowels.

Financial Comparison

The great variations in local and geographical conditions make it impossible to lay down hard and fast rules applicable to all countries. Practice as regards methods of renewal also varies. For example, in Great Britain up to a mile or two of sleepers may be renewed at one time, giving a much larger percentage of serviceable recovered sleepers than in those countries where the "spot" method obtains; in fact, up to between 40 and 70 per cent., the additional life thereafter varying between 10 and 20 years. Under normal conditions in South Africa, New Zealand, and Egypt the result approximates to this, but in other cases the additional life is practically negligible.

About 40 per cent. of timber, 45 per cent. of steel, and 5 per cent. of concrete sleepers are recovered with additional life periods of 10, 14, and 7 years respectively. Despite variation in figures, Mr. Train concludes that treated timber sleepers with fastenings approximate in cost to steel sleepers, concrete costing more than either, and that because of the track circuiting disadvantage timber sleepers are unlikely to be superseded as long as that material is available. If annual costs are examined, however, concrete may be cheapest in the long run, but this opinion is based on a 50 years' life for pre-stressed sleepers and experience is as yet insufficient to say whether this estimate is justified.

Full cell creosoting is the more common process, but except in Great Britain it is not general apparently to use pure creosote, but to mix it with 50 to 75 per cent. fuel oil. Maximum impregnation figure is 1 gal per cu. ft. in Great Britain with Baltic redwood, decreasing to ⅓rd gal. for Douglas fir. For Maritime pine and Scotch fir ½ gal. is used.

Figures received do not suffice to prove whether cost of creosoting is justified by the increased life obtained, but where softwood is used there is no doubt that the process is called for, unless there are local supplies of white wood which can be used directly at low cost.

Packing and Tamping

There is very great variation regarding cost of packing and tamping, and many figures probably cover different operations. Some may include cost of lifting as well as packing. Nevertheless, Mr. Train concludes that pneumatic or electric tamping costs less than hand beater packing, and shovel packing less still, making it the cheapest way of putting a good top on the track at the time of the operation. The life of any form of packing must play an important part in overall costs, and the suggestion is that power beating enables a track to stand up longer than any other method. It has been suggested that it would last twice as long, but Mr. Train considers this open to debate.

Organisation of Passenger Traffic

Reports on the economic and operating aspects of passenger-train working submitted to the International Railway Congress Association

TWO reporters investigated the various aspects of passenger train working covered by Question 3 before the International Railway Congress Association. Their full terms of reference were as follow:—

As regards passenger traffic, to report on the best policy for the organisation of train services from the points of view of frequency and composition of trains, so as to ensure successful transport at the lowest possible cost, whilst giving passengers reasonable facilities.

To consider in turn the cases of steam and electric lines, showing the extent of using steam trains and railcars for the former, and electric motor coaches and electrically driven trains for the latter, on lines with heavy, average, and light traffic, during and outside rush hours of the day.

M. Lorriot, Ingénieur en chef de la Division Centrale du Mouvement-Voyageurs, French National Railways, was appointed to cover the Continental countries and their overseas possessions. Mr. Ranald J. Harvey, Consulting Engineer to the Government of New Zealand, dealt with America, Great Britain, India, Dominions, Protectorates and Colonies, China, and Egypt.

Both reporters show that in all countries there has been an increase in the number of passengers per train-mile. This situation is dealt with at some length by M. Lorriot, who tabulates figures showing that between 1938 and 1945 the percentage of passenger receipts compared with total receipts increased in nearly all countries, whether they took part in the war or remained neutral. At the same time the percentage of passenger costs compared with total expenditure decreased. In France, for example, passenger receipts increased from 27 to 53 per cent. of the total, whereas costs fell from 47 to 32 per cent. This is accounted for by the fact that nearly everywhere fuel shortage necessitated the reduction of passenger train services, and at the same time goods traffic declined appreciably. Moreover, shortages of tyres and petrol curtailed road transport activities, so that much of the passenger traffic formerly lost to road undertakings returned to the railways. M. Lorriot concludes that railways should profit by the present situation to maintain as far as possible the existing balance between passenger and goods receipts and costs.

He quotes examples of countries which in the years before 1938 increased their passenger services with a view to regaining traffic, but for the most part the administrations concerned found that the increase in expenditure thereby entailed was not compensated by additional receipts. M. Lorriot puts forward the view that the remedy for unfavourable passenger service statistics should not be sought by adding to the frequency of services.

Success of High-Speed Trains

On the other hand, of the 45 railway administrations interrogated by Mr. Harvey, 19 had made experiments in increasing passenger traffic by the use of light high-speed trains, and seven administrations reported enthusiastically upon the results achieved from the points of view of finance, attractiveness to passengers, and reduced road competition. Four replies of this kind were received from the United States, two from India, and one from Australia. Mr. Harvey concludes that the capabilities of high-speed trains in countering the attractions of road travel have been demonstrated most successfully in the United States. Where these measures have been adopted, there has been at least a stop in the expansion of competition from the roads, and in some cases it practically has been eliminated.

The type of train found most successful has been designed to encourage traffic not only by high speed, but by additional comfort and other amenities. It is evident from the reports that there is an immediate public response to services combining these characteristics. Speed alone does not appear to produce the same results. With regard to the increase in the frequency of services on particular routes by the use of railcars, the twelve systems replying to Mr. Harvey which had adopted this experiment to counter road competition presented reports which in the aggregate were disappointing. British railways found that railcars did not give the flexibility required, and had substituted push-pull units in which the accommodation could be varied to suit requirements. These had been found very successful.

There was an almost universal and emphatic negative reply by the railways interrogated by Mr. Harvey to the question whether they favoured suspending a substantial number of passenger services, and in general there was an inclination to foresee a considerable increase in passenger train-mileage in the near future.

Limited Services with Heavy Loads

M. Lorriot found that some Continental countries did not intend at the best restoring their passenger services to above the level of 1938 (Sweden, Portugal, Switzerland, Italy), while others were considering a fairly extensive reduction of train-mileage (Belgium, Poland, Austria). M. Lorriot deals with the policy of the European railways in drawing up their future timetables. France proposes serving main lines during the day by two or three heavy trains of 640 tons on steam services, and 738 tons on electric services. The average speed will be from 43 to 47 m.p.h. At night there will be one or two sleeping car trains of similar weight and speed. Extra services will be put on for summer traffic to holiday resorts, and provision is being made for three or four stopping train services in daytime, capable of being replaced when conditions warrant it by railcars operating in pairs. The most important routes will be served also by express first and second class railcar sets, weighing from 344 to 392 tons, and operating at between 74 and 80 m.p.h. Such services will have a high standard of comfort, and additional fares will be charged. They will operate once or twice daily in each direction, and are intended for business men and foreign visitors. Similar views on the operation of main lines appear to be accepted by the other European railways.

There was no general agreement among the countries covered by Mr. Harvey's report as to the desirability of running trains of 650-700 tons at between 45 and 50 m.p.h., or lighter trains of 450-500 tons at 55-60 m.p.h., but British railways found the speed suggested too low and the loads too heavy. Replies as a whole suggested that no general recommendations could be made in this matter.

Most of the replies to Mr. Harvey showed that the extension of sleeping car services was favoured, together with the increased availability of such facilities for second and third class passengers. Most of the administrations replying are using only first class sleeping cars at the present time. Railcars are used on main lines only by 11 of the systems interrogated by Mr. Harvey which have adopted this form of transport. In nearly every case they are used to provide stopping services.

In his report on branch line services, M. Lorriot outlines the current policy of the French National Railways of replacing many stopping trains by railcars, with or without trailers. These will be of 600 h.p., 300 h.p., and 150 h.p. For lines with very light traffic it is proposed to use low-powered vehicles of 60-80 h.p., some of which will be converted from road buses. The replies to Mr. Harvey indicated that the systems concerned were using railcars of about 200 h.p., with 50 seats and luggage accommodation, on their branch lines. Mr. Harvey expresses surprise at the prevalence of mixed train services in the countries with which he deals, these being in use on not less than 35 out of the 45 railways which replied to his questionnaire, and being considered as an integral and economic component of the general services provided.

Abandonment of Mixed Trains

M. Lorriot, on the other hand, reports that all the administrations which replied to him intend to abandon the operation of mixed trains as soon as possible on account of the difficulties entailed, such as the maintenance of connections with main-line trains. His general conclusion as to the most economical method of serving secondary lines is to operate from two to four railcar services of varying power and capacity, and to retain a rake of steam stock for express parcels and mail.

Replies to a question regarding the use of regular-interval services on suburban lines, showed that in the countries dealt with by Mr. Harvey this was governed by local traffic conditions. M. Lorriot, however, quotes numerous Continental examples of regular-interval services. In France they are maintained on certain steam lines with heavy traffic, in addition to electric lines. The intervals between trains is generally from 20 min. to 30 min. at rush hours, and 1 hr. to 2 hr. at slack periods. Trains on the electrified lines consist of two-coach or three-coach sets, which can be coupled together according to requirements. Belgium provides a 30-min. interval service on the Brussels-Antwerp electrified line, and in the Brussels suburbs. In Holland, suburban trains run at 30-min. intervals, with two additional trains an hour at rush periods; the composition varies from four to six, or even up to 10 coaches according to requirements. A 20-min. service is operated by the Polish State Railways in the Warsaw district. Sweden favours intervals of 15 to 20 or 30 min., according to traffic requirements.

Both reporters record a general tendency towards the lightening of passenger rolling stock for all types of service by the use of light metals.

Mr. Harvey found that single-unit railcars of low horsepower and small seating capacity definitely were not favoured by the administrations he interrogated. There was a wide variation in the horsepower of the railcars in use, ranging from 180 h.p. to 750 h.p. In general, the large cars

were designed for use with trailers. About 250 h.p. to 300 h.p. represented the average horsepower favoured.

The question of dealing with holiday peak traffic requirements produced various opposing views. The cancellation of special reduced fares at such periods clearly was not popular among the administrations replying to Mr. Harvey. M. Lorriot reports, however, that in France it is considered desirable to suspend reduced fares at such times, although this does not appear to have been done in other European countries up to the present, but a suspension occurs in Belgium between August 14-19, and August 31-September 1.

Most of the countries replying to Mr. Harvey adopted a seat reservation system at holiday periods, special trains being run for passengers who had made advance bookings. Practically all the railways replying to him operate certain trains on which the issue of tickets is limited to the seats available. Half of the railways replying to the question prohibit the use of reduced fare tickets on specified trains; 12 do not do so; and the remainder make exceptions in certain cases. Fourteen railways favoured the staggering of holidays to flatten traffic peaks; 17 were opposed to the principle, and others replied that it was either impracticable or unnecessary.

M. Lorriot describes the operating measures taken to deal with holiday period traffic in France. Advantage is taken of the increase in the habit of reserving seats, and at rush periods advance bookings are in force in the case of certain heavily loaded trains. On other services admission tickets are issued free of charge, the number being equal to the number of seats available, plus 20 per cent. for standing room. It is found that these measures facilitate the distribution of passengers among the limited number of seats available on all services. The operating programme provides for running heavy double-headed trains, and makes use of all available coaches, including vehicles temporarily released from shops. Railway employees and their families are prohibited from using free passes at the peak holiday travel period. Negotiations have been entered into with Government departments and large factories in the Paris area for the purpose of staggering holidays with pay, particularly so as to ensure that the days on which holidays begin do not coincide with the rush periods.

M. Lorriot concludes with the observation that passenger services should be organised so that it is not necessary for goods rates to be increased in order to maintain the general financial balance, as this would make goods traffic particularly liable to competition from long-distance road transport. He recommends that administrations should draw up a balance sheet for passenger services so that receipts and expenditure from this source can be studied more readily than has been possible in the past.

It is pointed out by Mr. Harvey that the period covered by the reports necessarily has been one of "make do and mend" for many administrations, numerous development schemes having had to be shelved temporarily. He considers that similar conditions will prevail, although on a greatly decreasing scale, until the next International Railway Congress.

Railway Housing Policy

Report presented to the International Railway Congress on the provision of housing accommodation for employees

QUESTION 4 under consideration by the fourteenth session of the International Railway Congress in Lucerne has the following terms of reference:—

The interest the railway administrations would have in building houses for the staff of all ranks, or in assisting the building of such houses (including policy and practice of railway administrations in connection therewith and advantages derived therefrom).

A report on the above question has been prepared by Mr. A. P. J. Ball, Estate Manager & Rating Agent, L.M.S.R., who, in conjunction with M. Eduardo Antonucci, of the Italian State Railways, compiled a questionnaire for circulation to the railway administrations concerned. Mr. Ball has received replies from the British railways, Iraq, New Zealand, South Africa, the Sudan, Argentina, the United States of America, and India.

In general, the replies indicated that railway administrations which provide housing for their employees do so primarily where it is impracticable for men to find accommodation close to their work. The British railways reported that there were no schemes for the further provision of such accommodation, but where existing railway houses had been occupied by non-railwaymen and became vacant, the opportunity was taken to house railway employees. In certain exceptional cases, where staff in key positions had been transferred and were required to reside near the place of their appointment, houses were being acquired and let to such employees.

The Great Western Railway outlined its scheme of 1923 for letting houses to employees at certain centres where the housing position was difficult. A number of estates was laid out on land acquired by the company, and a lease of the site granted to associations of employees. An appropriate ground rent was charged, and the associations arranged contracts for the erection of houses.

The company advanced 90 per cent. of the cost of the buildings by way of mortgage at 4 per cent. per annum, the total being repayable in 100 equal instalments over a period of 50 years. The remaining 10 per cent. formed the capital of the association, and was subscribed by employees desirous of becoming tenants on the estate. Under this scheme 1,646 houses were erected at eight centres, the largest number being 1,059 dwellings on two estates in the London suburban area.

Only the Iraqi State Railways reported that it was their policy to provide accommodation for all staff necessary to operate the system. Administrations other than the G.W.R. who replied stated that they had no existing scheme for assisting in the construction of houses and flats for letting to railway employees through the agency of building associations. A table appears in the report showing the total number of houses and flats owned by the railway administrations, and occupied by present employees. The numbers are as follow:—

	No. of houses
British railways	32,562
Iraq	2,722
New Zealand	3,978
South Africa	14,061
Sudan	4,252
N.W.R. (India)	56,208
South Indian Railway	11,435
G.I.P.R.	27,533

Replying to a question concerning the effect of housing on the railway budget, the New Zealand Government Railways reported that the departmental dwelling statement showed a loss of £112,732 for the year ended March 31, 1946; however, if dwellings were not provided, the expense of supplying staff with temporary accommodation on transfer to new appointments would become greater than the loss shown by the statements. The Sudan Railways had spent £73,000 on the provision of housing accommodation up to 1945.

The rent collected annually was £18,700, and maintenance cost £30,000 a year out of a total annual railway expenditure of £3,000,000. In India the construction of houses by the railways had failed to realise a minimum return of 4 per cent. on the capital cost which was adopted as the target figure.

The British railways did not consider that it would be advantageous, even if possible, to provide a house for every member of their staff, since there was an inherent desire on the part of individuals to choose their own dwellings. South Africa and Argentina concurred in this view. New Zealand considered that the provision of housing on such a scale would facilitate staff changes and add to mobility.

Assistance for House Purchase

The British railways, South Africa, and the Sudan described systems for assisting employees in the purchase of houses for their own occupation. Housing loan schemes are operated by the Great Western Railway and the Southern Railway with an interest rate of 4 per cent. per annum, for periods up to 20 years. The G.W.R. advances up to 90 per cent. and the Southern Railway normally up to 80 per cent. of their surveyor's valuation. The L.M.S.R. and the L.N.E.R. both have arrangements with well-known building societies for housing loans to railway staff. A house ownership scheme is operated in South Africa, and the interest rate was reduced from 3½ per cent. to 3 per cent. in April, 1933. Loans are made to the full value of houses as assessed by the administration's valuer. Housing loans are granted also in the Sudan at an interest rate of 2 per cent. per annum. In Argentina there is a National Law providing for housing loans with an interest rate of 4 per cent., including life insurance.

Regarding Government and municipal housing schemes, it was reported by Great Britain, New Zealand, and Argentina that no preference was given to railway employees.

Summarising the answers to the questionnaire, Mr. Ball observes that the present housing shortage is world-wide, and that in general the problem is being dealt with by means of comprehensive Government and municipal house construction schemes on a national basis. He quotes the Great Western Railway housing undertaking as the only reported example of assisted house construction for renting to staff. In general, the British railways provide houses for letting, assisting in such provision, and arrange loans to staff for house purchase, but the schemes do not

pretend to meet all staff housing requirements, as many thousands are reasonably and comfortably housed at moderate rents under local authorities or private owners.

The two railways in the United States which replied to the questionnaire, the Baltimore & Ohio and Bessemer & Lake Erie, do not provide houses for any staff, nor do they assist in such provision by staff housing loan schemes or otherwise.

There are considerable differences between the housing policy and practice of different railway administrations. Briefly, the advantages derived by the administrations who provide and assist in the provision of houses for staff are stated to be that employees securely and comfortably housed give more efficient service; also the existence of railway-owned houses adds to the availability and mobility of staff, thus facilitating railway operation.

The Focus of International Traffic

The construction of the Alpine tunnels enabled Switzerland to fulfil its natural function as the "turntable of Europe"

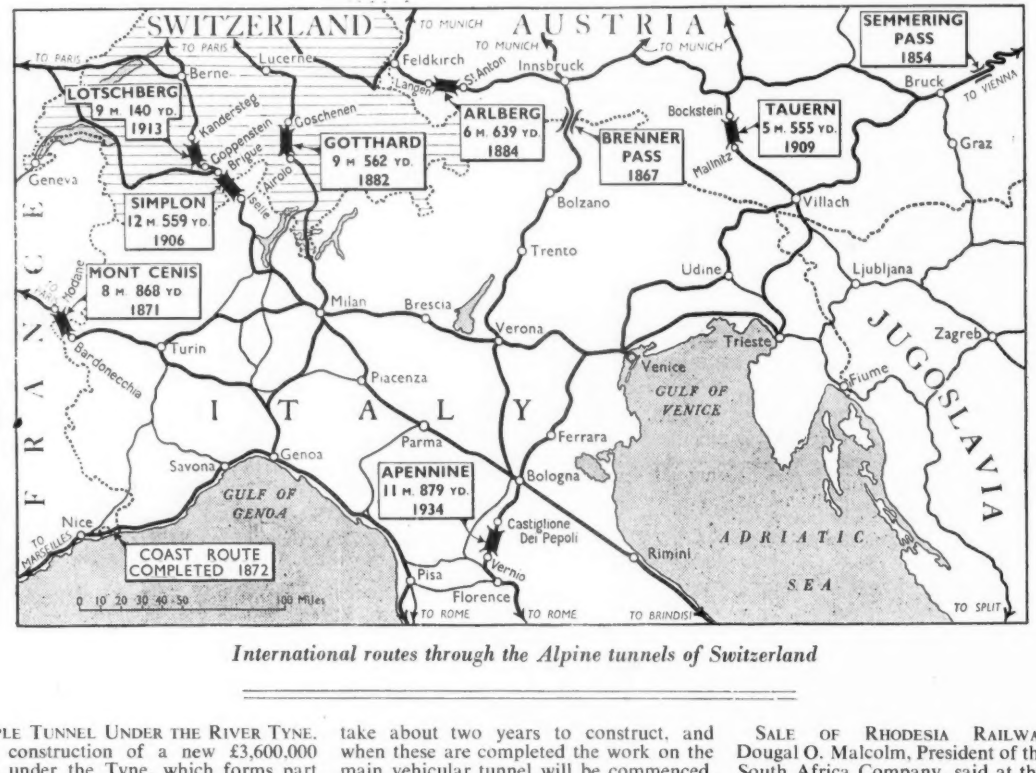
THE first railways in Switzerland were built to serve internal requirements, for the barrier of the Alps then prevented the country from assuming the status of a focal point for international services which it has since achieved, and to which it is geographically adapted. Although the first Alpine tunnel, the Mont Cenis, was driven between France and Italy, the formation of the Gotthard Railway Company on September 1, 1871, inaugurated the phase of development which has earned for Switzerland the title of "the turntable of Europe."

The Gotthard Tunnel was opened in 1882. On the main line from Lucerne to Milan, it today carries through services between Ostend, Calais, Milan, and Rome, as well as trains originating in Switzerland for Milan and Genoa.

In 1906 the opening of the Simplon tunnel established what is best known as the route of the "Simplon-Orient Express" from Calais and Paris to Istanbul. The Istanbul service operates three times weekly, but there are daily through coaches from Calais and Paris to Rome, and Paris to Trieste; and four times a week from Paris to Venice.

At Brigue, north of the Simplon Tunnel, the route is joined by the Lötschberg line, opened after completion of the tunnel of that name in 1913 as a means of shortening the approach to the Simplon from Berne and the North. Trains from Berne to Domodossola connect with services to the principal Italian cities.

Although the Arlberg Tunnel is off Swiss soil, its opening in 1884 brought Switzerland on to the international route from Western Europe to Vienna and the Balkans, and resulted in two of the "Orient" group of international expresses serving the country. The "Arlberg-Orient Express" crosses Switzerland from Basle to Zurich, Sargans, and Buchs, conveying through carriages daily from Calais and Paris to Vienna, Bucharest, Prague, and Belgrade. On three days a week sleeping cars are provided between Paris and Prague; and Basle and Warsaw.



International routes through the Alpine tunnels of Switzerland

TRIPLE TUNNEL UNDER THE RIVER TYNE.—The construction of a new £3,600,000 tunnel under the Tyne, which forms part of a scheme to open up Tyneside and bring easier access and better transport facilities to the heavily industrialised regions lying on each side of the Tyne between Newcastle and the river mouth, was begun by Mr. Alfred Barnes, Minister of Transport, at an official ceremony on June 4. At present there is no road-crossing of the lower Tyne other than by ferry. The project provides for three separate tunnels for vehicles, cyclists, and pedestrians, and for approach roads linking the tunnels with the main traffic routes on each side of the river. It is expected that the pedestrian and cycle tunnels will take about two years to construct, and when these are completed the work on the main vehicular tunnel will be commenced. A special feature will be the provision of twin escalators at the approaches to each of the tunnels and a lift at each entrance.

FOSTERING INDUSTRY.—A practical suggestion for fostering industry is put forward in a folder published by the L.N.E.R. The folder shows in what way the extensive service offered by the L.N.E.R. Industrial Agent can help the business man to solve the problem of selecting sites for factories and warehouses. Under sections entitled: the idea, the inquiry, the result, and the cost, the folder reviews the scope of this service.

SALE OF RHODESIA RAILWAYS.—Sir Dougal O. Malcolm, President of the British South Africa Company, said at the annual general meeting of the company on June 5 that he considered that the terms on which the Government of Southern Rhodesia had purchased the share capital of Rhodesia Railways Limited represented a fair bargain. The purchase price of £3,150,000, with interest thereon at 2½ per cent. from March 31, was paid to the Rhodesia Railways Trust on May 16. Sir Dougal Malcolm said that the sum of £3,150,000 agreed upon for the share capital of Rhodesia Railways Limited as at March 31 last, represented a capitalisation of the £125,000 dividend on a fraction under a 4 per cent. yield basis.

Control of Intermediate Sidings in Block Sections, Great Western Railway

A new method of electrical interlocking control in conjunction with the block telegraph

By G. H. Crook,
Chief Assistant to Signal & Telegraph Engineer, G.W.R.

THE control of intermediate sidings in block telegraph sections involves interesting problems. The question of safety is axiomatic, but as such sidings generally are used only infrequently, the economic factor assumes considerable importance. Trailing connections in main lines at one time were connected to small signal boxes and protected by home and distant signals. The protection was to some extent illusory, unless the box was equipped with block telegraph, as in most cases trains shunting at the siding would be divided, with a portion standing on the running line in the rear of the home signal.

Ground Frame Working

On the Great Western Railway this practice for some years has been superseded by ground frame working, electrically controlled from the signal box in the rear and locking the block starting signal. The method possesses the advantage that the trainmen requiring access to the siding must communicate by telephone with the signalman, who gives the release. In due course he receives the restoration signal and is thus kept fully informed as to what is going on in the section.

Although ordinary trailing connections may be protected by such control, either from the rear or advance signal box, the case of a trailing connection, say, in the up line crossing by means of diamond in the down line, to a siding on the down side, technically is much more difficult. Generally, it has been accepted that the only method of controlling this type of layout is by the provision of a block signal box with standard outdoor signals, obviously involving considerable expense for the signal box structure, locking frame, signals, block telegraph, and the usual refinements such as automatic train control, block release of starting signals, interlinking of home and distant signals, electric repeaters, telephones, and so on. The availability of a competent signalman to open and work the box as required and ultimately switch out also is involved.

An interesting and novel system, illustrated on the accompanying diagram, was introduced in March, 1947, on the Great Western Railway, whereby Fron Sidings signal box, between Whitehurst and Cefn, involving a diamond connection, was replaced by ground frame working, controlled electrically in conjunction with the block telegraph system, with telephonic communication to Whitehurst signal box, from which the control is exercised. Fron Sidings box was opened only as required for traffic, as is Cefn, the more usual block telegraph working being between Ruabon South and Whitehurst. Complication which otherwise would result from block telegraph switching is thus avoided by controlling the sidings from Whitehurst.

The siding on the up side—Edwards Siding—is released from Whitehurst by means of an electrical control instrument, which can be operated only when the up line block is indicating "train on line," and when turned to release the electric key instrument at Fron Sidings compulsorily holds it in that condition so long as the key at the sidings is out of its instrument and available for use in the Annett lock controlling the point lever. The Whitehurst control instrument has four positions and its operation is as follows:—

Position 1. Normal
Position 2. Requires up line block at "train on line"
Position 4. Holds up line block at "train on line"; locks up starting for Cefn, or up advanced starting for Ruabon South when Cefn switched out
Releases ground frame key (Edwards siding)
Position 3. Holds up line block at "train on line." When ground frame key (Edwards siding) is restored, control instrument can be turned to normal (Position 1)

The down siding—Limeworks Siding—is the more interesting example of the co-ordinate electrical control method. Here, again, an instrument is provided at Whitehurst to release the corresponding key instrument at Fron Sidings. In addition to the control of the up line block, similarly to the case of the up siding already described, the requirement is that the down block section must be proved clear and the block instrument indication subsequently changed to "train on line" before the release can be given. The down starting for Whitehurst is also locked at danger and the control instrument operates in four positions, as follows:—

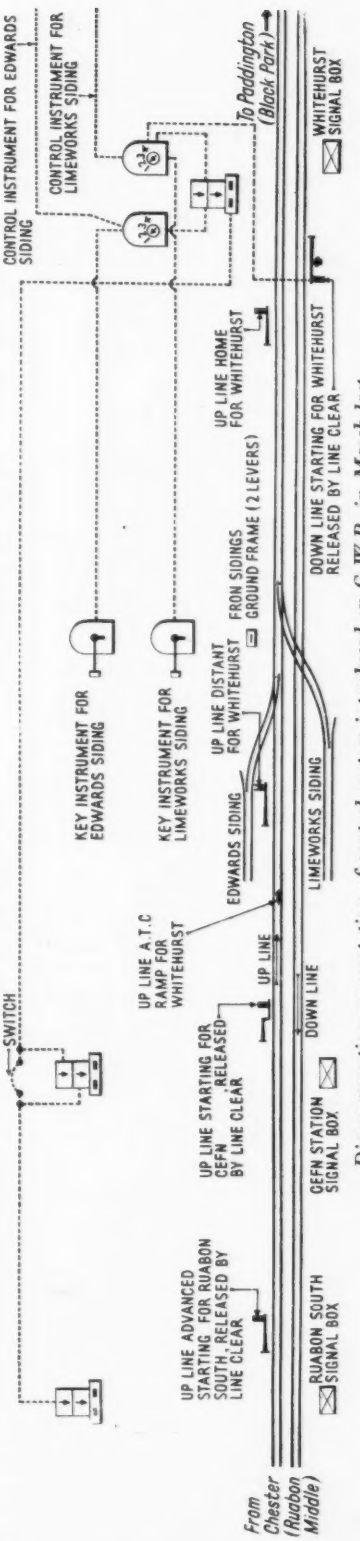
Position 1. Normal
Position 2. Requires up line block at "train on line" and down line block at "line clear" Locks down starting for Whitehurst
Position 4. Holds up line block at "train on line" Locks up starting for Cefn, or up advanced starting for Ruabon South when Cefn switched out
Releases ground frame key (Limeworks siding), provided down line block is at "train on line"
Position 3. Holds up line block at "train on line." When ground frame key (Limeworks siding) is restored, and down line block is at "train on line" control instrument can be turned to normal (Position 1)

In No. 2 position, the signalman at Whitehurst sends a special bell signal "shunting into forward section" (3-3-2) to Cefn or Ruabon South, and when the block indicates "line clear" it enables the instrument to be turned to No. 4 position, and "train entering section" is then sent to Cefn. Not until the down line block is changed to "train on line" is the release of the key at the ground frame effective.

On completion of the work at either siding, the guard must give the signalman an assurance that no detached vehicles are left foul of the running line, and, with the Annett key restored to No. 1 position in the key instrument at the ground frame he must press a plunger to give the requisite release to the signal box. In the case of Limeworks Siding, the signalman at Whitehurst then sends a special bell signal "shunt withdrawn" to Cefn and the down line block is restored to the normal position; the up line block continues to operate under standard regulations until the up train clears the section at Whitehurst normally.

Variations of the Arrangement

There are other possible variations of the electrical control. For instance, if the diamond crossing had been situated nearer to Cefn, and if that box normally had been open, the control could have been


CONTROL INSTRUMENT FOR EDWARDS SIDING
CONTROL INSTRUMENT FOR LIMEWORKS SIDING
To Paddington (Black Park)
WHITEHURST SIGNAL BOX
UP LINE HOME FOR WHITEHURST
FRON SIDINGS GROUND FRAME (2 LEVERS)
DOWN LINE STARTING FOR WHITEHURST RELEASED BY LINE CLEAR
KEY INSTRUMENT FOR EDWARDS SIDING
KEY INSTRUMENT FOR LIMEWORKS SIDING
UP LINE DISTANT FOR WHITEHURST
EDWARDS SIDING
LIMEWORKS SIDING
UP LINE A.T.C RAMP FOR WHITEHURST
SWITCH
UP LINE
DOWN LINE
UP LINE STARTING FOR CEFN RELEASED BY LINE CLEAR
CEFN STATION SIGNAL BOX
UP LINE ADVANCED STARTING FOR RUABON SOUTH, RELEASED BY LINE CLEAR
RUABON SOUTH SIGNAL BOX
From Chester (Ruabon Middle)

Diagrammatic representation of control system introduced on G.W.R. in March last

exercised from there, where a control instrument first would have proved the block telegraph in the normal position and then compelled the sending of "blocking back outside home signal" (3-3). The up line connection would have been released by a control instrument at Cefn, which would have locked the starting signal at that box.

The choice of the preferred method depends on the position of the siding in relation to the rear or advanced signal box, block telegraph switching, and any other local conditions.

The method outlined above secures proper co-ordination with block section signals and the block telegraph system, and appears to provide a logical method of control of intermediate sidings, resulting in considerable simplification of signalling and economy in installation and maintenance. The installation described has been introduced with a view to affording a service test of the principle and practice of the method.

A noteworthy feature is that the whole of the control arrangements have been effected without introducing any additional levers at the signal box exercising the control. During the war many sidings were brought into use on the Great Western where, by applying the electrical control instrument, it was possible to effect the required interlocking at a number of boxes without using levers. This was of great value in some instances, where there were no spare levers available.

In many cases electric locks already exist on signals involved in the control, and the electrical method, using an existing asset, is, therefore, logical as well as economic. Further, mechanical interlocking additions and alterations, which generally require an occupation of the locking frame and considerable expense, are avoided.

Other applications of the electrical control instrument have been developed by the Signal & Telegraph Engineer's Department, and some interesting schemes are under consideration.

Milan to Domodossola Electrification

Improvements in international connections made possible by converting a further section of the Simplon route

A NOTEWORTHY step towards the rehabilitation of the European railway system was taken with the inauguration on May 4 of electric traction on the Italian section of the Simplon route from Milan to Domodossola. The inaugural ceremony was attended by the Italian Minister for Transport, Sr. Ferrari; the Swiss Minister of Communications, M. Celio; Dr. M. Paschoud, General Director (Engineering and Operating), Swiss Federal Railways; Dr. R. Grimm, General Manager of the Berne-Lötschberg-Simplon Railway; and others.

Two important advantages have been obtained by the electrification of this line, which, since the opening of the Simplon Tunnel in 1906 and of the Lötschberg Tunnel in 1911, has provided the shortest route from Lausanne and Berne to the sea, and the most direct connection between Western and Eastern Europe *via* Italy. These advantages are (1) a reduction in the journey time from Milan to Domodossola from 2 hr. 55 min. to 1 hr. 45 min.; and (2) as a result of increasing the average speed of trains from 60 km.p.h. with steam to 120 km.p.h. with electric traction, the ability to increase the service on the line.

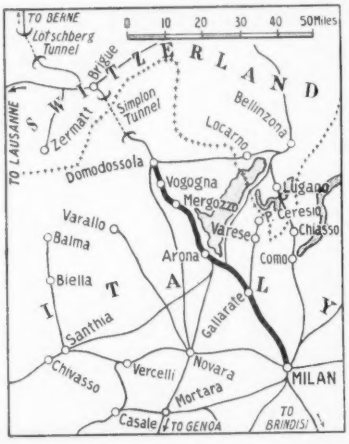
Work Interrupted by War

Some of the electrification work had been begun in 1940, but was interrupted by the war, so that when in April, 1946, the Italian State Railways Administration decided to proceed with the electrification, it amounted almost to a new start. At the same time there were new difficulties caused by the shortage of raw materials and the fuel crisis in Italy last winter. However, in about 10 months the administration had completed the works necessary for electric operation, although some items, notably the signalling and telephone system, still await completion.

The line from Milan to Domodossola is 125 km. (77·6 miles) in length. Of this distance, 43 km. (26·7 miles) from Milan to Gallarate were electrified already on the third rail system, since this section is shared with the Milan-Gallarate-Porto Ceresio line. It was necessary, therefore, to provide separate electrified tracks for the Milan-Domodossola and the Milan-Porto Ceresio trains, with special arrangements at Gallarate Station. From Gallarate to Arona, the Domodossola line has a single-track section, requiring special precautions to permit the maintenance of high speeds.

Between Gallarate and Domodossola, especially in tunnels, it has been necessary to lower the level of the rails to accommodate the increased height of electric locomotives with pantographs. This work alone entailed the construction of seven groups of sidings; six substations; six electric air-compressor sets and one petrol compressor; five miles of air piping; and six miles of light railway. Ten narrow-gauge locomotives and 120 wagons were used during excavation of the rock on which the track had been laid. The rail level has been lowered by from 4 to 23½ in.

Another important feature of the work



Milan—Domodossola line, Italian State Railways, and its connections

has been the revision of the layout at Domodossola Station owing to the fact that it now is served both by Swiss trains operated on 15,000 V. single-phase, and by Italian trains using d.c. at 3,000 V. The station has been divided into two sections, and the Italian locomotive propels its train into the area served by the 15,000-V. overhead line, where the coaches are attached to the Swiss locomotive. In addition, arrangements have been made to realign several curves by the Hallade method, especially between Arona and Domodossola, where there were several with a radius of under 14 ch.

The conversion of the line involved electrifying 254½ track-miles between Milan and Domodossola Three substations have been provided, at Gallarate, Arona, and Vogogna, each with two 2,000-kW. converter sets, supplied from a commercial 45,000-V. grid.

The construction of the overhead 3,000-V. line, and of the substations and other buildings, occupied 250,000 working days, and consumed 6,000 tons of iron, 2,000 tons of copper, and 19,620 cu. yd. of mortar. Temporary arrangements have been made for the telephone system. From Domodossola to Mergozzo the cable is laid underground, but from Mergozzo to Milan it follows an overhead route at a distance from the railway, involving 658 miles of wire. When cable for the Mergozzo-Milan section is delivered to the State Railways, the overhead line will be transferred to the State Telephones Administration.

In connection with the signalling installation, it is stated that Arona and Premosello will be equipped with up-to-date fittings for allowing electric control of points and signals throughout the line, and the whole route will be provided with cab-signalling apparatus, since conditions at certain places are such that drivers' outlook is restricted. The cost of these installations will reach a total of 1,000 million lire.

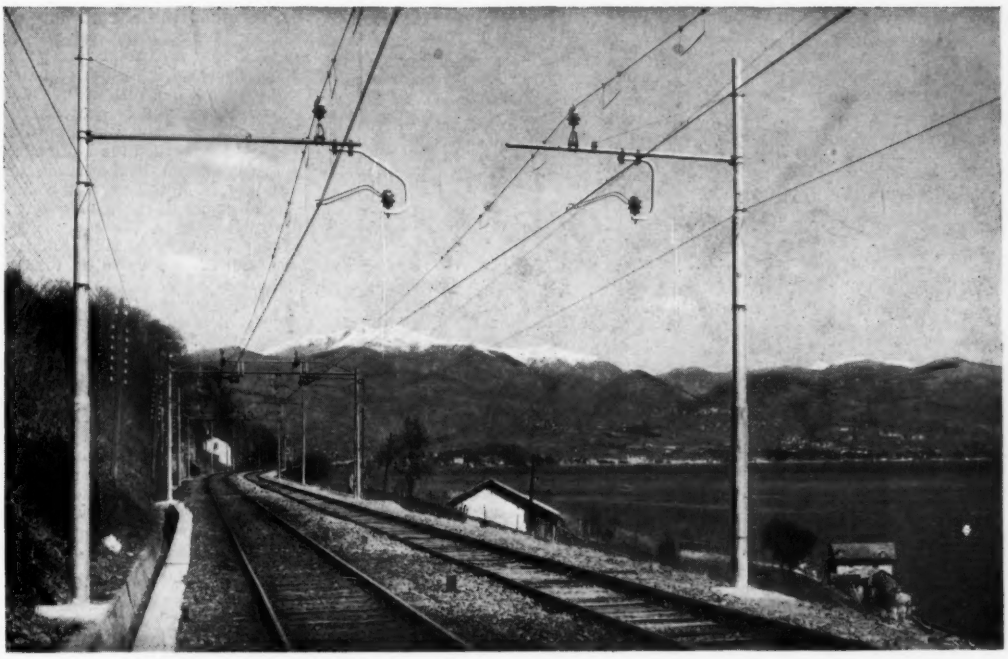
Further Electrification Proposed

These developments represent, however, only one aspect of post-war railway plans in Italy. The State Railways Administration expects to complete this year the electrification of the Arona-Novara-Mortara line, so that it will be possible to run through electric trains from Domodossola to Genoa and Savona. Next year the electrification of the Turin-Milan-Verona-Venice-Trieste line will provide continuous electric traction from the Franco-Swiss frontier almost to Lubljana (Jugoslavia), with noteworthy advantages to connections between Great Britain and the Balkans by the "Simplon Orient Express," as the trip through Italy will be about 3 hr. shorter.

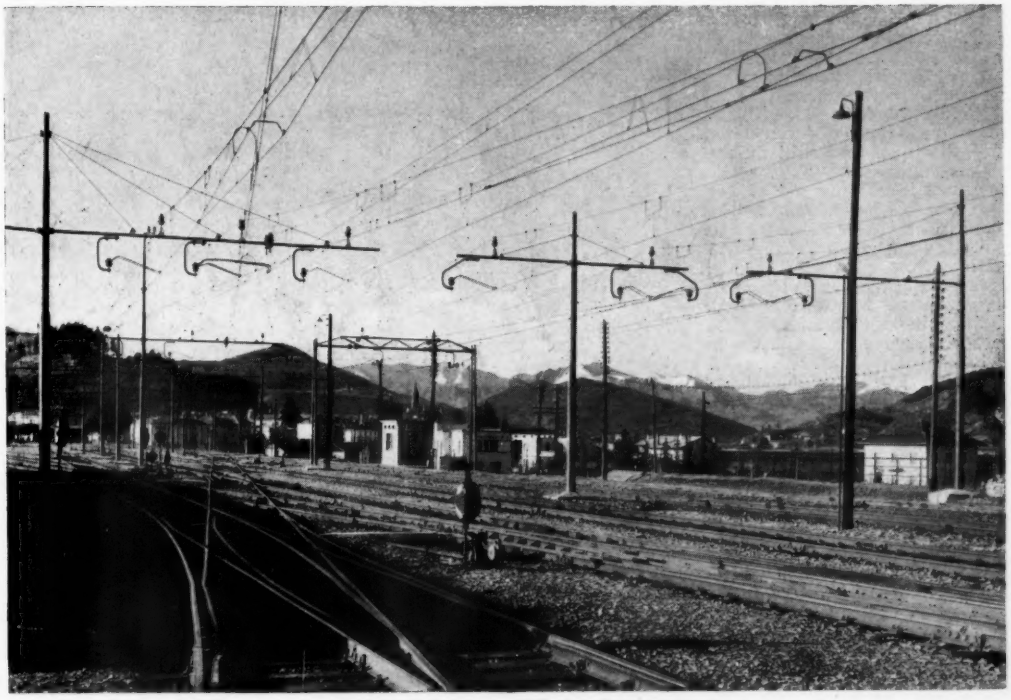
In this connection, Sr. Ferrari, Minister for Transport, stated in an interview to the Press on the inaugural Milan- Domodossola electric train, that by 1948 Italian railways should have resumed their pre-war efficiency; steps had been taken towards electrification of the Sicilian railways with the help of Italian and foreign capital. He said that the goods wagon stock was being rebuilt at the rate of 500 units a month.

With reference to the programme outlined by the Minister in his interview, it should be recorded that trials have been carried out recently on the Turin-Milan line with a four-bogie articulated diesel train designed for making the journey between Turin and Venice in 5 hr. Accommodation is provided for 124 first and second class passengers, and the train is powered by two Fiat diesel engines of 350 h.p. each. Three of these trains are being built.

Milan to Domodossola Electrification



Overhead equipment on the section of the line skirting Lake Maggiore, north of Arona



View of Arona Station after electrification. Arona is the junction for the line to Novara and Genoa, which will be electrified at a future date

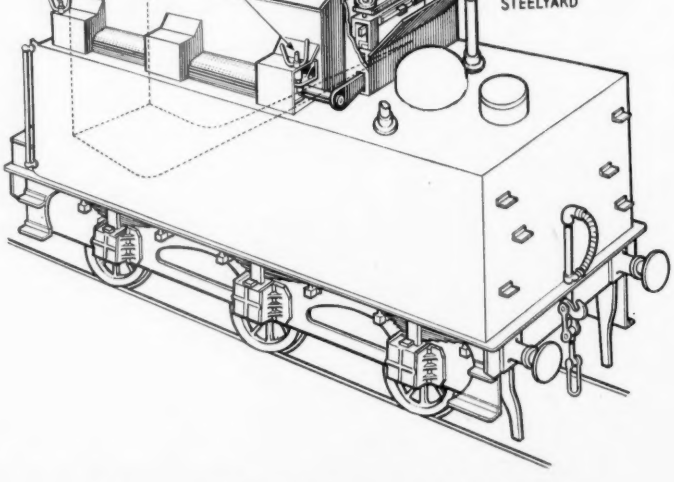
Coal-Weighing Tenders for the L.M.S.R.

Accurate checks of coal consumption provide a basis for instruction in economical use of fuel

THE L.M.S.R. has paid much attention to studying locomotive coal consumption, and two dynamometer cars have been employed in carrying out periodical tests. In these trials, a known weight of coal is placed in the tender, sufficient for the test run to be made, and at the conclusion the coal remaining is removed and weighed. The coal used, with suitable allowances for lighting up and standing time, is related to units of work done by the engine on the train, as recorded by the dynamometer car, to give 1 lb. of coal per drawbar-horsepower hr.

These full-scale trials are undertaken usually only on a small number of engines in a class, either to compare coal consumption with other classes, or to measure the effect of alterations or special fittings.

On account of increased difficulties with coal supply, both in quantity and quality, the checking of coal consumption is of increasing importance. With a view to permitting a closer study of the methods of firing, and the effect on consumption of traffic delays and other features of present-day operation, together with a closer watch on the effect of varying qualities of coal, two special coal-weighing tenders have been completed to the design of Mr. H. G. Ivatt, Chief Mechanical Engineer, L.M.S.R., in conjunction with the Transport & General Engineering Co. (Leeds) Ltd., this firm being responsible for the manufacture of the actual weighing mechanism. The underframes, wheels, and axleboxes are those of the standard 4,000-gal. tender in use on the larger locomotives, but new tanks and coal bunkers have been fitted, which will hold 3,750 gal. of water and 7¾ tons of coal, as against the 4,000 gal. and 9 tons of the standard arrangement.



Arrangement of coal bunker and weighing mechanism

The tenders, of course, can be coupled to any standard engine.

The coal-weighing device, which is not intended for use while the engine is in motion, is arranged as follows. A separate coal bunker has been provided, which has vertical sides, but a self-trimming back, and rests normally on six cone seatings on brackets on the tank top. It can be locked in this position, to prevent relative movement and consequent damage to the knife edges of the weighing mechanism. When it is desired to weigh the coal, the locks are released; the load then is transmitted through two shafts running longitudinally along the tender tank top to two main levers situated at the rear of the coal space, and thence *via* another lever to a steelyard. The steelyard is calibrated to read directly in tons and quarter cwt. by the use of sliding weights, and is provided with devices to lock it in the weighing position or otherwise, to safeguard the knife edges.

In operation, having ascertained that the bunker is in the correct position and all locks engaged, the tender is coaled in the normal manner. The cover is then removed from the steelyard, and the steelyard locking device and those on the bunker itself are released so that the load is transmitted through the lever system to the steelyard, where it is measured by adjustment of the large and small weights on the arm. The locking devices are then returned to their normal positions, and the cover replaced. The tender is then ready for the road.

Locomotive inspectors ride with the engines hauling these tenders whenever they are working a train, and coal weighing is undertaken so that the consumption for the day can be broken down as desired into that used for lighting up, shed duties, shunting, and also while working the train and during any traffic delays which may occur. Variations in consumption secured by the best methods of firing and engine working can be demonstrated to the crew, and methods can be developed for getting the best results from the lower grades of coal now having to be used.

WEST HIGHLAND LINE WORKS FOR LOCH SLOY ELECTRIC POWER SCHEME.—Numerous heavy works have been undertaken by the L.N.E.R. on the West Highland line in connection with the Loch Sloy electric power scheme for the North of Scotland Hydro-Electric Board. The transport of workers engaged in the undertaking has necessitated new stations being built at Inveruglas and Glen Falloch, together with a halt serving a P.O.W. camp near Faslane Junction. Sidings and a 15-ton crane have been installed at Inveruglas. At this point, also, it was necessary for the pipes carrying water from Loch Sloy to the power station to pass below the railway embankment, involving the construction of a new bridge. While the bridge was being built, the railway line was diverted temporarily for about a quarter of a mile so that traffic could be maintained without severe speed restrictions. At Inveruglas and Glen Falloch, the stations are of L.N.E.R. standard concrete slab construction, with ash filling between the slabs. The platform at Faslane Junction has a sleeper wall with ash filling.

New Southern Railway Suburban Stock

Four-coach sets designed in accordance with preferences expressed by passengers

RECENTLY the Southern Railway engaged the services of a firm of experts to investigate the views of London suburban passengers regarding the design of coaching stock. Hundreds of regular peak-hour travellers were interviewed, and their replies showed a decided preference for the centre-corridor type of vehicle, particularly among those whose journeys are of from 15 min. to 30 min. duration.

Acting on the results of the investigation, the Southern Railway is introducing the four-coach electric sets to which brief reference was made in our June 6 issue. The normal composition of each set will be three open vehicles and one of the compartment type. In the examples shown at Cannon Street Station on June 3, the open coaches were divided by internal partitions into three sections for trailers and two sections for motor coaches, but future vehicles will be open throughout their length. In the present arrangement, one four-door section seats 42 passengers, and a three-section open vehicle provides 110 seats. Seating is arranged so that passengers sit in threes and twos on each side of the central aisle. There are six seats across the coach at the ends.

Adequate Standing Space

Doors are provided between every block of seats, and the layout provides ample standing space, with easy circulation throughout the vehicle to permit the occupation of seats becoming vacant during the journey. Rails are to be provided below the luggage racks at a convenient height for standing passengers to hold, since lack of "strap-hanging" facilities was one of the chief objections voiced against the open type of vehicle. Later stock will be fitted with draught-breakers, sliding glass ventilators, and other minor improvements.

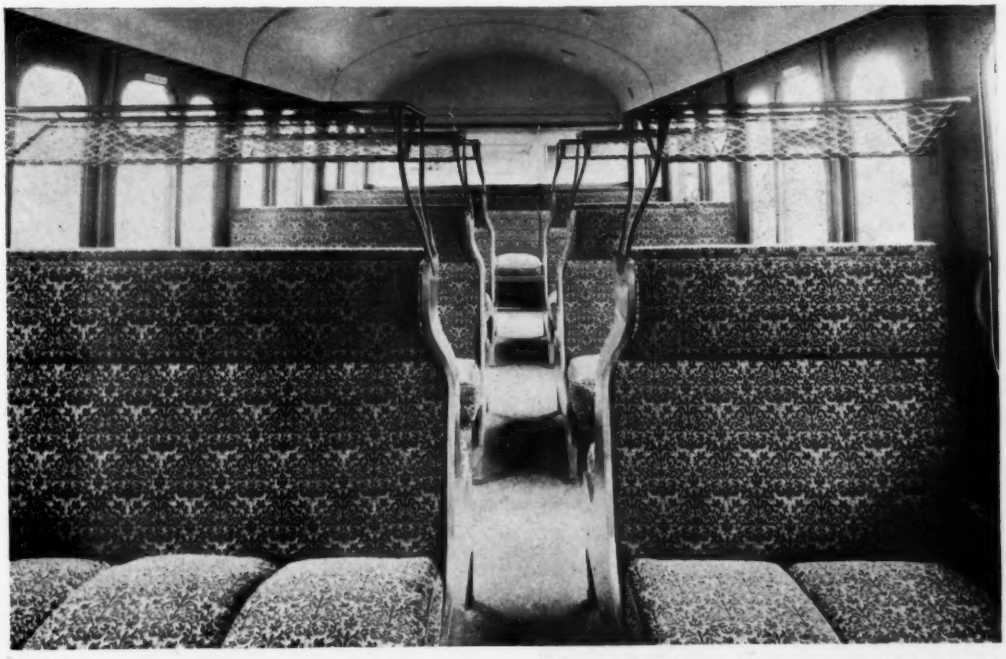
The compartment stock contains ten compartments in trailers and eight in motor vehicles, all seating six a side. In all vehicles extra width has been obtained by slight curvature of windows and the use of pillars and sides only ¾ in. thick. The spacing between opposite seats also is wider than usual. There is a saving in weight of between 1 ton and 30 cwt. per vehicle. Trailer coaches have ten compartments and motor coaches eight. The seating accommodation for 120 passengers in a 10-compartment coach represents 20 more seats than in previous corresponding vehicles. A four-coach set of the new stock provides 382 seats, and a complete train of eight coaches seats 764, as compared with 680 in older vehicles.

The guards' compartments in the new coaches are fitted with the standard type of Southern Railway periscope, giving a view ahead over the carriage roofs. It can be used by the guard when seated, and is fitted with a manual wiper operated by a lever adjacent to the seat. The glass is hinged so that it can be lowered for cleaning the outside surface from inside the van when necessary. An emergency door communicates between the driver's and the guard's compartment, enabling the driver to step to safety should he see a buffer-stop or other collision to be inevitable.

The preference for open vehicles expressed by passengers has its advantages for the Southern Railway, since it is considered that pilfering and damage will be reduced by the lessened likelihood of travellers responsible for these depredations being unobserved. Ten of the new trains have been completed, and have been running on Eastern Section services to Bexley Heath, the Dartford Loop, Sevenoaks, and Orpington.

A census of Southern Railway main-line passengers carried out in 1945 showed a majority in favour of the compartment type of coach.

Six-a-side compartment



Interior of new open-type suburban coach, showing arrangement of seating with three seats to the left and two to the right of the central aisle

The Transportation Club, London

Cocktail bar

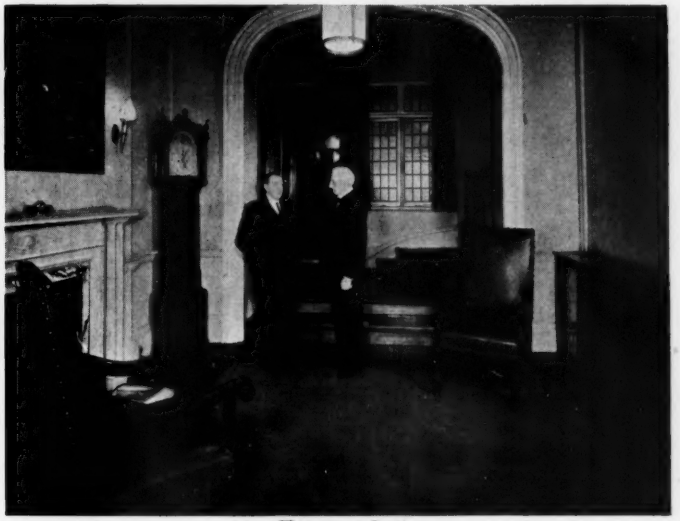
Dining room

Lounge

Library

The Transportation Club

Begun as a wartime amenity—To be continued



Entrance hall

WE do not know to whose inspiration was due the conception of the British Railways Transportation Club which was enthusiastically sponsored by the four British main-line railway companies and the London Passenger Transport Board.

In January, 1943, the Club, situated at 44, Wilton Crescent, London, S.W.1, was formally opened by Sir Ronald Matthews, then Chairman of the Railway Companies' Association. He was assisted by Mr. Averell Harriman, Special Assistant to the President, U.S.A., and Lt.-Colonel Unwin Simson, Administrative Secretary representing the High Commissioner for Canada.

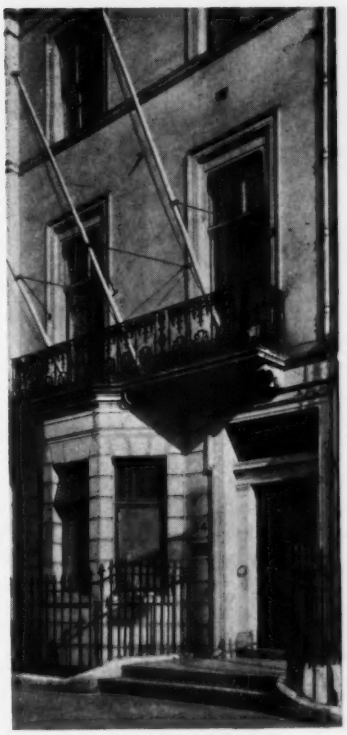
In articles published in the January 8 and 15, 1943, issues of *The Railway Gazette* the reason for the establishment of the Club was described, namely, to afford hospitality during the war to Canadian and American transportation officers temporarily in this country, who in peacetime were employed by transport undertakings. Membership was by nomination, and a number of officers of each of the British railways and the London Passenger Transport Board were also made members to fraternise with the Canadian and American members.

The Club admirably fulfilled its purpose and was fortunate in its choice of its Secretary, Colonel K. R. N. Speir, formerly Assistant to Chief Commercial Manager, L.M.S.R., who proved much more than a Secretary and acted as host, counsellor and friend to its members from overseas.

The war being over and the British Railways Transportation Club having served the purpose for which it was created, it was at first decided to close the Club at the end of January, 1946. This decision, however, was rescinded on the representation of a number of the members of the Club who felt that, there being no Transportation or Traffic Club in London such as those in New York and Chicago, the Club, if possible, should be continued on a permanent basis. The railway companies agreed to allow their furniture and equipment lent from their several hotels which had been temporarily closed during the war to remain at the Club for a longer period. A Provisional Committee was formed to arrange ways and means for the Club's continuance.

During the past year the Club has continued to function and a non-profit-making company limited by guarantee, entitled the Transportation Club Limited, has been formed under the provisions of the Companies Act, 1929, the liability to each member on a winding-up being limited to £1. This company takes over the assets and liabilities of the Transportation Club and is acquiring the lease of 44, Wilton Crescent, for a term expiring on March 25, 1977. The Grosvenor Estate and the London County Council have granted a licence for the use of the premises for the purposes of a Club. The necessary funds for the acquisition of the lease and for a certain amount of refurnishing has been provided by an issue of 4 per cent. debentures.

The qualifications for membership of the Club have recently been broadened and now include candidates from professions and undertakings germane to the transportation industry as well as directors, administrative, and executive officers of public and private undertakings engaged in the transport of passengers and goods by land, air, or water.

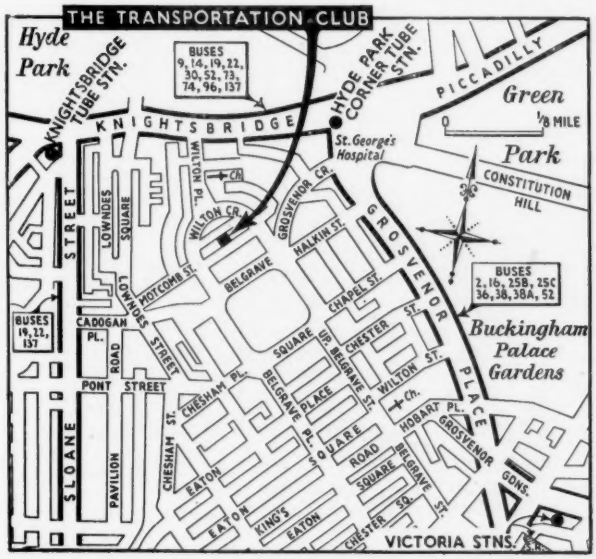


Exterior

Already the membership totals over 300, and is representative of every form of transport. Directors and officers of the four main-line railway companies, the London Passenger Transport Board, road haulage, bus companies, steamship lines, and air lines, and also consulting engineers and manufacturers, are among its members.

The management is vested in its Council, among the members of which are:—J. A. Kay (Chairman), James L. Bartley, David Blee, W. S. Graff-Baker, Albert Endicott, R. H. Hacker, D. H. Handover, S. G. Hearn, J. Ness, R. M. T. Richards, T. W. Royle, G. S. Szlumper, T. A. Munroe, A. J. Webb, T. Winchester, and K. R. N. Speir.

The annual subscription is 7 gns.; Country Members 4 gns.; Overseas Members 2 gns. Readers interested or desirous of further information should communicate with Colonel K. R. N. Speir, Secretary, The Transportation Club Limited, 44, Wilton Crescent, S.W.1.



Location of the Club

XUM

LMS 'In perspective' No. 2
The Permanent Way
1 GROUND SIGNALS USED FOR SHUNTING
2 DOUBLE LINE JUNCTION CONSISTING OF 2 SETS OF TRACKS & 1 DIAMOND CROSSING
3 DIAMOND CROSSING
4 MILE POST SHOWS MILES FROM LONDON
5 A TURNOUT
6 SWITCH RAILS
7 PLAIN TRACK RAILS
8 POINT RODDING
9 CHECK RAIL TO ENSURE THE TRAIN TAKES THE RIGHT ROAD
10 DISTANCE FROM ONE RAIL TO THE OTHER IS CALLED THE 'FOUR FOOT'
11 DISTANCE BETWEEN TWO SETS OF TRACKS IS CALLED THE 'SIX FOOT'
12 STOCK RAILS
LMS

The second of the series of five L.M.S.R. posters referred to on pages 578 and 594 last week

RAILWAY NEWS SECTION

PERSONAL

RAILWAY EXECUTIVE COMMITTEE

On the occasion of his retirement from the position of Chief General Manager of the London & North Eastern Railway Company, Sir Charles Newton, M.Inst.T., has resigned as a member of the Railway Executive Committee, an appointment which he has held since 1939.

The Minister of Transport, the Rt. Hon. Alfred Barnes, M.P., has appointed Mr. Miles Beevor, who succeeded Sir Charles in the position of Chief General Manager of the L.N.E.R., to be a member of the Railway Executive Committee as from June 6, 1947.

Sir Reginald Robins, General Manager of the Kenya & Uganda Railways & Harbours, has arrived in the United Kingdom on leave.

We regret to record the death, at the age of 49, of Mr. George H. Iles, Assistant Dock Manager, Cardiff, Great Western Railway.

Lt.-General Sir Ronald Weeks has been invested with the United States Legion of Merit, Degree of Commander, by the American Ambassador. He is a Director of Associated Electrical Industries Limited.

We regret to record the death on June 6, at the age of 53, of Sir Alexander Galloway Erskine-Hill, Bt., K.C., D.L., a Director of the London & North Eastern Railway Company.

COLONIAL RAILWAY APPOINTMENT

Mr. A. H. Sloly, Permanent Way Superintendent, First Class, to be Assistant Engineer-in-Chief (Civil), Jamaica Government Railway.

Mr. A. T. Read, Assistant for New Works, Accommodation & Private Sidings, to the Chief Commercial and Chief Operating Managers, Watford H.Q., L.M.S.R., since 1943, has retired, after 47 years' service.

We regret to record the death on June 3, at the age of 60, of Mr. Frank Hodges, J.P., a member of the Central Electricity Board and a Director of William Beardmore & Co. Ltd. and other companies. He was formerly Secretary of the Miners' Federation of Great Britain.

Sir Edmund Crane (who is a Director of Tube Investments Limited) has relinquished, at his own request, all his executive responsibilities in, and his position as Joint Managing Director of, the Hercules Cycle & Motor Co. Ltd. (a subsidiary of Tube Investments Limited). Mr. Arthur Chamberlain has been appointed sole Managing Director of the company.

Mr. Henry Dutfield has been elected Chairman of the Road Haulage Association for the third year in succession. Mr. J. A. M. Bright (Onward Road Transport, Selby), Mr. C. Holdsworth (I. W. Holdsworth Limited, Halifax) and Mr. B. G. Turner (Thomas Allen Limited, London) have been re-elected Vice-Chairmen, and Mr. Robin L. Young (Young's Express Deliveries Limited, Glasgow) has been elected a Vice-Chairman to fill the appointment left vacant by the death of Mr. Isaac Barrie.

Mr. John Auld, M.I.Mech.E., whose death, at the age of 76, we recorded last week, retired in 1941 from the position of Principal Assistant to the Chief Mechanical Engineer, Great Western Railway, after nearly 54 years railway service. He served an apprenticeship on the Glasgow & South Western Railway, and subsequently held appointments with the Great North of Scotland Railway and the London, Tilbury & Southend Railway. He returned to the Glasgow & South Western Railway, and was appointed District Locomotive Superintendent, Glasgow. In 1910 he became Locomotive Superintendent of the Barry Railway. On the incorporation of the Barry Railway into the Great Western Railway in January, 1922, Mr.

The late Mr. John Auld

Principal Assistant to Chief Mechanical Engineer, G.W.R., 1932-41

Auld was at first appointed Mechanical Engineer at Barry Docks and Divisional Locomotive Superintendent for the Cardiff Valleys Division; but in September, 1922, he became Docks Assistant, and in January, 1924, Docks & Personal Assistant, to the Chief Mechanical Engineer, to whom he became Principal Assistant in January, 1932.

We regret to record the death on June 1 of Mr. William Frame, Chairman of Frame's Tours Limited, and Senior Vice-President of the Residential Hotels Association of Great Britain.

The services of Mr. D. McKenna, Development & Research Officer, L.P.T.B., have been lent by the Board on his being appointed a member of a mission to "investigate the suitability of conditions in the Northern Territories and other parts of the Gold Coast, Northern Nigeria, and Gambia for large-scale mechanised production of groundnuts for export."

For the past twenty years an official "passenger" on almost every Royal Train journey, Mr. Arthur Butler, Head Office Inspector, L.M.S.R., has retired, after 41 years' service. While acting as judge in the company's pre-war station garden competition, Mr. Butler visited every one of the 2,300 passenger stations on the L.M.S.R. system.

Dr. W. Meile, President of the General Direction, Swiss Federal Railways, is a citizen of Mosnang (St. Gallen), and was born on August 6, 1886. He studied economics (political economy) at Fribourg, Berne, Munich—where he took his doctor's degree—and Berlin. After travelling several times to study economic questions, he was head of the Secretarial Department of the North-East Swiss Rhine Navigation Association at St. Gallen from 1913 to 1916. From 1916 to 1917 he was Editor of the *Swiss Exporter;* and from 1917 to the beginning of 1938 was Manager of the Swiss Industries Fair. From 1919 to 1923 he was a member of the No. 3 Region Railway Council. He was National Councillor, 1936-38, and representative of the Federal Council on the new board of the Swiss People's Bank, and a member of the management and supervisory committee of the Swiss Trade Development Institute. He is President of the Committee for Advising on Higher Professional Education & Qualifications. In 1938 Dr. Meile was appointed General Director (Commercial & Legal), Federal Railways, and since 1940 has been President of the General Direction, with special charge of the Financial and Staff Departments.

Dr. Maurice Paschoud, General Director (Engineering & Operating), Swiss Federal Railways, is a citizen of Lutry and Forel, and was born on July 21, 1882. He took technical courses, and gained in 1904 a diploma as engineer at the Lausanne Engineering School. He continued his studies in Paris and Berlin; and became a doctor—with a mathematics degree—at the Sorbonne College, Paris. He taught from 1910 to 1920 at the *Progymnasium* and *Realgymnasium* at Lausanne, and from 1920 in the University there, of which he was Rector from 1928 to 1930. From 1926 Dr. Paschoud was a member of Lausanne Municipal Council. He was a National Councillor, 1928, and State Councillor of Vaud Canton, 1930. Since 1932 he has been General Director, Federal Railways (up to 1938 Commercial & Legal, and since then Engineering & Operating, Departments).

Mr. Paul Kradolfer, General Director (Commercial & Legal), Swiss Federal Railways, is a citizen of Märwil (Thurgau). He was born on April 13, 1891, at Frauenfeld. Mr. Kradolfer studied engineering at the Federal Technical High School, Zürich, and took a diploma in 1914 as a civil engineer. From 1914 to 1918 and from 1920 to 1928 he practised that profession in Umbria, Italy. He was associated in the construction of the Spoleto-Norcia electric railway and bridge-design work, and with plans for the Rimini-San Marino electric narrow-gauge line. He also carried out private work on street and road construction, and engineering and building work, in Umbria. He acted as Secretarial Assistant from 1918 to 1920 to the Chief Engineer and Purchasing Engineer of the Berne power station undertaking for the building of the Mühleberg generating station. Mr. Kradolfer had his own offices in Frauenfeld from 1928 to 1932. He later was appointed Supervisory Engineer, First Class, in the Railway Section of the Federal Post & Railway Department, and, in 1935, Deputy Director, Federal Transport Department, and, in 1936, Director. In 1940 he was appointed General Director (Commercial & Legal Department), Federal Railways.

The second of the series of free L.M.S.R. posters referred to on pages 510 and 554 last week

XUM

Dr. W. Meile

President of the General Direction, Swiss Federal Railways

Dr. M. Paschoud

General Director (Engineering & Operating), Swiss Federal Railways

Mr. P. Kradolfer

General Director (Commercial & Legal), Swiss Federal Railways

Mr. Fernand Chenaux, Regional Manager, No. 1 Region (Lausanne), Swiss Federal Railways, is a citizen of Gollion (Vaud), and was born on March 20, 1884. He obtained a diploma as civil engineer at the Lausanne Civil & Mechanical Engineering School in 1905, and was engaged with the firm of Bell & Company, Kriens, from 1905 to 1907. In the latter year he entered the service of the Swiss Federal Railways in the Civil Engineering Department of the former No. 2 Region. Later he went to Lausanne, and transferred to the Operating Department. He was appointed Inspector in that department in 1913, and Divisional Superintendent in 1928. In 1932 he was made Deputy Operating Superintendent. Since 1937 he has been Manager of the No. 1 Region.

Mr. Cesare Lucchini, Regional Manager, No. 2 Region (Lucerne), Swiss Federal Railways, is a citizen of Montagnola (Ticino), and was born on July 20, 1885. He studied at technical high school from 1900 to 1908, and took a diploma as civil engineer. In 1908 he entered the service of the former Gotthard Railway, and from January, 1913, to November, 1914, was in charge of widening works at Chiasso Station. From December, 1914, to the end of 1915, he was a military engineer engaged on the Murten and Bellinzona fortifications; and from 1916 to 1918 he was Engineer in charge of the Ritom power station works; from September, 1918, he was in charge of the cable railway, pipe line and approaches to the Ritom generating station itself. In 1922 Mr. Lucchini became Deputy Engineer of the Barberine power station works. He was Chief of the Construction Department offices at Olten from 1923 to 1926, and then Deputy Chief Engineer at the head offices, of the Federal Railways; he was Chief Engineer, No. 2 Region, from 1930 to the end of 1938, and since then has been Manager of that region.

Dr. Walter Berchtold, Regional Manager, No. 3 Region (Zürich), Swiss Federal Railways, is a citizen of Winterthur, and was born on October 1, 1906. He studied law, political economy and languages at the Universities of Paris, Nottingham, Siena and Zürich, and became Doctor of Law, Zürich, in 1930. He practised for a short time in Winterthur local district court; and at the end of 1930 entered the service of the Swiss Federal Railways, passing through all the operating branches. He was appointed a law officer in the Staff Department of the General Direction in 1933, and entered the Secretarial Department in 1934. In 1933 Dr. Berchtold had become a regular correspondent of the *Neue Zürich Zeitung;* and in 1938 he entered the editorial department of the commercial section of that paper. Shortly before he had made a tour in the U.S.A. to study transport. In June, 1945, he was appointed Manager of the No. 3 Region, Swiss Federal Railways.

Mr. F. Chenaux

Regional Manager, No. 1 Region (Lausanne), Swiss Federal Railways

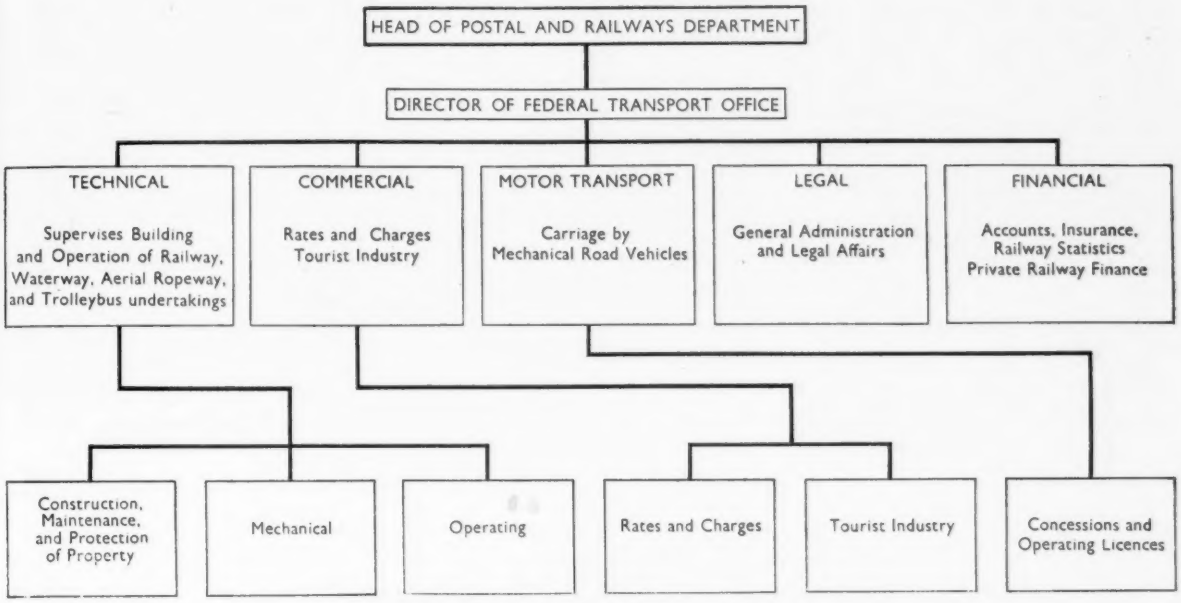
Mr. C. Lucchini

Regional Manager, No. 2 Region (Lucerne), Swiss Federal Railways

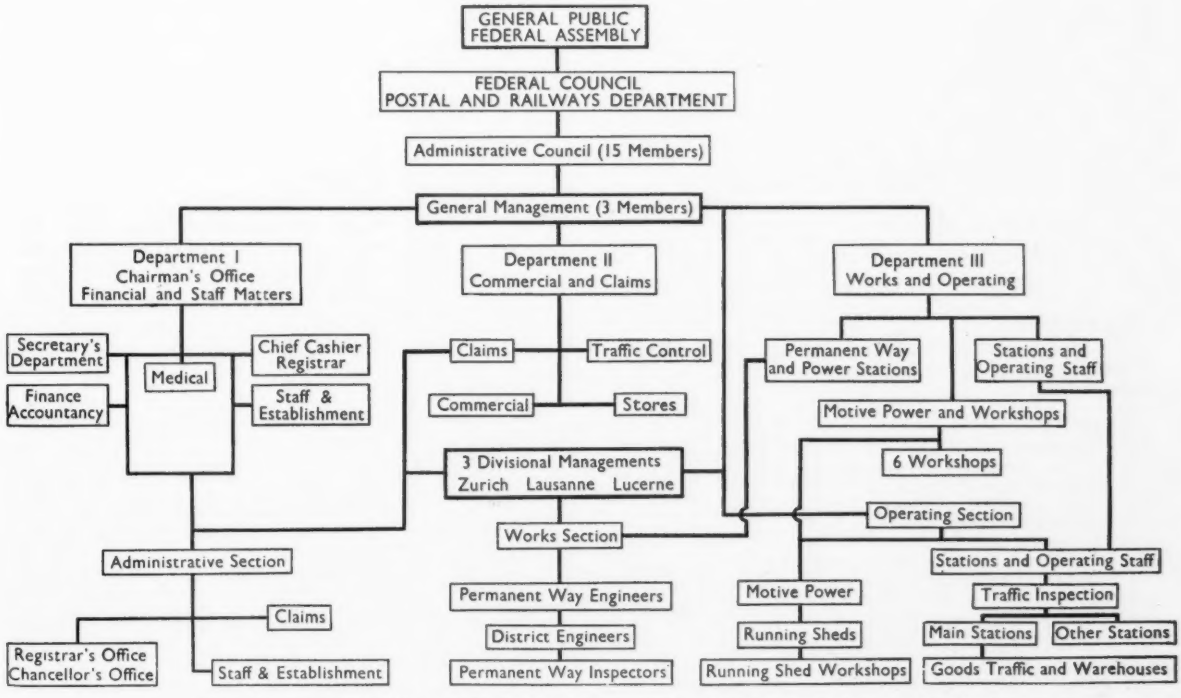
Dr. W. Berchtold

Regional Manager, No. 3 Region (Zürich), Swiss Federal Railways

Swiss Federal Railways Organisation



Organisation of the Federal Ministry of Transport



Organisation of the Swiss Federal Railways under the Law of February 1, 1923

The Law of October 15, 1897, provided for five divisional managements for the Federal Railways (corresponding to the five main-line systems to be nationalised) with headquarters at Lausanne, Basle, Zurich, St. Gall, and Lucerne ; and an administrative council of 55 members. Under this organisation there were 5 general managers ; 15 divisional managers ; and 5 divisional boards, comprised of 15 to 20 members. The divisions were reduced to three in 1923. The divisional boards were abolished by Decree of the Federal Council of December 24, 1935, effective on January 1, 1936

XUM

The King's Birthday Honours List

The following is a first selection of honours of transport and industrial interest from the King's Birthday list:—

Baron

Mr. Frederick Montague, C.B.E., M.P. for West Islington, 1923-31, and since 1935. Parliamentary Under-Secretary of State for Air, 1929-31. Parliamentary Secretary, Ministry of Transport, 1940-41, and Ministry of Aircraft Production, 1941-42. For political and public services

Knights Bachelor

Mr. John Smith Boyd, Permanent Vice-President, Shipbuilding Employers' Federation. Assistant to Superintendent, N.E. Area, L.N.E.R., 1923-27.

Mr. John Samuel Dodd, Past-President, Associated British Chambers of Commerce.

Mr. Ralph Freeman, Senior Partner, Freeman, Fox & Partners, Consulting Civil Engineers.

Mr. Russell Kettle, Senior Partner, Deloitte, Plender, Griffiths & Company.

Dr. Andrew McCance, D.Sc., F.R.S., Member, Advisory Council to the Committee of the Privy Council for Scientific & Industrial Research. Deputy-Chairman & Joint Managing Director, Colvilles Limited.

Mr. Andrew Simpson Macharg, Senior Partner, McClelland, Ker & Company, Glasgow, Chartered Accountants. Director, North British Locomotive Co. Ltd.

Mr. Greville Simpson Maginness, President, British Employers' Confederation. Chairman & Managing Director, Churchill Machine Tool Co. Ltd.

Mr. William Peters, C.M.G., H.M. Senior Trade Commissioner in the Union of South Africa.

Professor Arnold Plant. For services to Government Departments. Member of Advisory Committee on Railway Subjects, London School of Economics & Political Science.

Mr. Robert Hill Tolerton, C.B., C.B.E., D.S.O., M.C., Under-Secretary, Ministry of Transport.

G.B.E. (Civil Division)

Lt.-Colonel Sir John Robert Chancellor, G.C.M.G., G.C.V.O., D.S.O. For services to the Ministry of Agriculture & Fisheries. Lately Director, Associated Electrical Industries Limited.

K.B.E. (Civil Division)

Sir Harry Harrison Burn, Imperial Chemical Industries Limited, Calcutta, Bengal.

C.B.E. (Civil Division)

Mr. Cecil Bentham, Engineering Consultant to the Admiralty, Past-President, British Engineers' Association.

Mr. Cyril Russell Dashwood, O.B.E., Chief Accountant, Great Western Railway.

Mr. John Henry Gunlake, lately Assistant Statistical Adviser, Ministry of Transport.

M.B.E. (Civil Division)

Mr. Arnold Leslie Crewe, Staff Assistant, Southern Area, L.N.E.R.

Mr. Arthur Ernest England, Chief of Engine Working Section, Traffic Department, Waterloo, Southern Railway.

Mr. Frederick George Hewitt, Stationmaster, St. Pancras, L.M.S.R.

Mr. Wilfrid Naylor. For services as Assistant Rolling Stock Controller, L.N.E.R. (Now Assistant Passenger Manager, N.E. Area).

Mr. R. T. Sawyer has been appointed Manager of the Research Department, American Locomotive Company. He has been associated with the company since 1930, and has been active in the design of diesel-electric and gas-turbine locomotives. Mr. Sawyer is Chairman of the Co-ordinating Committee on Gas Turbines of the American Society of Mechanical Engineers.

L.N.E.R. Appointments

The L.N.E.R. announces the following appointments:—

As Production Engineers, Chief Mechanical Engineer's Department: Mr. K. P. James, M.I.Mech.E. (formerly Production Engineer with the Churchill Machine Tool Co. Ltd.), and Mr. W. A. Smyth, M.I.Mech.E., M.I.Loco.E. (formerly General Works Manager, Guest, Keen & Nettlefolds Limited).

As Cost & Works Accountant, Chief Accountant's Department: Mr. R. Glendinning, M.A., C.A., A.C.W.A. (formerly Chief Accountant, Philco Radio Group).

L.P.T.B. Appointments

Mr. C. E. Dunton, Permanent Way Engineer (Railways), to be Civil Engineer (Development), Department of the Chief Engineer.

Consequent on the above appointment, Mr. K. Brinsmead, previously Mr. Dunton's Principal Assistant, to be Acting Permanent Way Engineer (Railways).

"Belgium House" Reception and Dinner

A reception and dinner were held on June 9 in connection with the official inauguration of "Belgium House," Marine, Railways and Tourist Offices, Regent Street, London, W.1. Among many who attended were:—

Mr. A. van Acker (Belgian Minister of Communications), Mr. Alfred Barnes, M.P. (Minister of Transport), Mr. van Hecke, Mr. A. Mertz, Mr. K. W. C. Grand, Mr. David Blee, Mr. George Orton, Mr. V. M. Barrington-Ward, Mr. O. H. Corble, Mr. John Elliot.

The Indian State Railways Annual Dinner

After a lapse since 1939, the Indian State Railways annual dinner was revived this year, and was held at the Café Royal on June 2, Sir Leonard Wilson presiding.

Others present were Sir R. E. Marriott, Brigadier H. L. Woodhouse, Lt.-Colonel W. T. Everall, and Messrs. G. C. Laughton, D. S. Burn, A. P. Goldney, J. M. D. Wrench, G. S. Bocquet, J. C. Highet, W. A. Anderson, A. M. Sims, V. H. Boalth, C. E. Spurgeon, D. H. Furley, F. R. Hawkes, B. C. L. Bean, H. Dale Green, M. S. Gregory, A. Heath, W. Leach, H. W. Puttick, W. J. Sorby, O. W. Watkins, N. Young, P. S. A. Berridge, C. Brerton, G. J. Eades, H. Hinton Cooper, F. G. Griffith, C. H. Griffith, H. W. Huggins, B. Moody, E. B. N. Taylor, J. Wise, A. E. Aylott, F. Barker, H. N. Brock, E. L. Ensor, L. H. Gannon, C. E. Hall, F. G. Langdon, S. Marchant, W. H. J. Pyne, C. Scarff, F. Vibart, W. R. M. Bennett, N. Calder (Hon. Sec.), D. Cardew, M. V. Grant, H. W. Meakins, R. L. Meehan, J. N. E. Nagle, L. V. Pont, W. C. Rodgers, G. Thompson, S. P. Flowerdew, J. C. Gibson, Gordon Jones, A. C. Robertson, G. W. N. Rose, H. H. Saunders, H. C. Wallace, J. A. Kay, F. S. Bond, J. S. Tritton and guest, A. R. Gundry and four guests, P. D. Low, J. A. W. Gillies and guest, and Dr. Rishworth and Major Flowerdew.

In proposing the toast of the evening, The Indian State & Government Railways, the Chairman first expressed the thanks of all present to Mr. Calder for undertaking to organise the dinner in difficult circumstances after a lapse of eight years. The institution of this reunion function was really inaugurated by the holding of a North Western Railway Dinner in 1906. The first occasion on which it became a State Railways Dinner was in 1912. In spite of the obvious difficulties of revival, there were about 25 per cent. more present this year than in 1939. Sir Leonard regretted that Mr. H. B. Holmes—who for 15 years was hon. secretary—Sir Guthrie Russell, and Colonel Emerson—now home on leave—were among those unable to attend.

Turning to the subject of the State Railways, the Chairman dwelt on the changing times. Two years ago there were still 580 British officers on the various lines, but numbers must be expected to fall rapidly in the near future. The Indian Member for Commerce recently had stated that the policy now was that there should be no further recruiting of non-Indians, but Europeans in the service must not be treated unjustly or unfairly. Sir Leonard hoped that the centenary of Indian railways would see many British officers still in their service.

The railways had done great service to India, especially in reducing famine to a minimum and in opening up the country and developing its trade. He sketched briefly their history from the opening, in 1853, of the first 20-mile section of line from Bombay to Thana—now part of the Great Indian Peninsula main line—and the initial 37-mile length of the East Indian system from Howrah to Pandua, completed in 1854, down to recent years with 41,000 route-miles of line open for traffic, a record of which we might justly be proud.

The Chairman then referred to the levelling up that was now taking place between the wages of the lowest paid staff and the emoluments of senior railway officers; the difference between the two in the past had been greater in India than in almost any other country, but under the new conditions should be very greatly reduced.

Whatever the future of India, said Sir Leonard, there must still be some central authority to run the railways and take the place of both the Railway Board and the Indian Railway Conference Association, in co-ordinating all railway activities.

He then reviewed the remarkable achievements of Indian railways during the war. They had been depleted of personnel and material for the Middle East and elsewhere, when they were suddenly called on to form the main lines of communication for the campaign in the North East to resist Japanese invasion. In all, some 20,000 men had been trained for technical railway units in addition to 40,000 employed in making munitions, and to the large staff required for maintaining ever-increasing rail traffic in India during the war. Recent high records in receipts were a great credit to all concerned, and not least to the Indian staff. He, personally, had confidence in the Indian personnel and its future. Everyone must have sympathy for Indians in wishing to run their railways in their own way. He wished them the very best of luck.

This year's dinner, it was generally agreed, was a particularly happy and informal affair, and the complete absence of that almost official stiffness which marked some of its predecessors added greatly to the enjoyment of the evening.

The Transport Bill in the House of Lords

Amendments in Committee: Membership of Commission to be increased: Government defeated three times

On Monday last, the Committee stage of the Transport Bill opened in the House of Lords, and it is intended to devote three days a week to a consideration of the proposed amendments, over 200 of which have been tabled.

On the motion to go into Committee on the Bill, Lord Balfour of Burleigh protested at what he considered the entirely insufficient reasons given to the House for the presentation of the Bill, and the completely unsatisfactory answers given to criticisms.

The fact that the Bill was given a second reading did not diminish in any way the responsibility on the House to go thoroughly into it. The House had two duties, first, that of elucidation, because no one could say the Bill was fully elucidated in the Commons, and, second, the duty of the education of the country and to some extent the education of those Lords who sat behind the Government.

"I did suggest it would be better if, instead of the owners retaining control, there should be retention of competition between rail on the one side, road on the other, with "C" licences in between. If Lord Addison says there are difficulties and dangers inherent in the plan put forward by me, they are nothing to the difficulties and dangers inherent in the Bill."

The Marquis of Salisbury, Leader of the Opposition, supporting the protest, wanted to know why the Government was bringing in this legislation, and if it was really behind the nationalisation of transport. The country, he said, had been given to understand that the criterion of all the proposals for nationalisation was to be the efficiency of the industry. It, therefore, seemed it was up to the Government to make the case for nationalisation.

Viscount Addison said that he was perplexed as to the inner meaning of this demonstration. The speeches in the second reading debate by Government speakers were capable speeches. The Government did not want a glorious scramble between road and rail transport, and the railway companies took a contrary view to Lord Beveridge on this subject, and realised the necessity of harmonising their services with road transport.

The House then went into Committee. The first amendment, moved by Lord Beveridge, was to increase the size of the Transport Commission from 5 to not more than 10 members, including the Chairman.

Lord Addison said that the Minister was agreeable to the enlargement of the Commission, and suggested that the number should be 8, of whom 4 should be full-time members.

Viscount Swinton described this as "an auspicious beginning of the Committee stage," and Lord Balfour of Burleigh and Lord Beveridge withdrew their amendments.

Lord Teynham moved an amendment to provide that hotels and refreshment places should be self-supporting and should be provided only when no such provision at reasonable prices was otherwise available and that the Minister was satisfied that it was in the public interest that such provision should be made.

Viscount Bridgeman, seconding, said that if publicly run hotels were subsidised from other sources of revenue, they would be in competition with the outside hotel industry.

Lord Morrison thought the Commission would have to do a good deal in gingering up refreshment facilities. If all such premises where a loss was made were closed, the public would be greatly inconvenienced.

Viscount Swinton said that the Commission should become restauranteurs and hotel proprietors only as a reasonably incidental activity to its operation of transport undertakings.

The amendment was withdrawn on the understanding that the matter will be discussed at a later stage.

The Opposition, with a block of amendments on which a long discussion ensued, strongly opposed the powers of the Transport Commission in regard to the manufacture of goods in undertakings taken over.

The discussion was chiefly concerned with motor chassis and bodies, and the chief amendment of the block, moved by Lord Brabazon of Tara, provided that, in addition to limiting the Commission to the manufacture of motor chassis for experimental purposes, it should not be allowed to manufacture bodies except for experiment.

Lord Hacking pointed out that valuable export trade was going to be lost by the Commission taking over firms which had overseas orders which would not be fulfilled by other firms.

Lord Addison said he was authorised by the Minister to say that he was not prepared to accept the complete veto which would follow if the amendments were accepted, but he was prepared to enter into discussions with a view to limiting the power to manufacture bodies insofar as that power was taken over by the Commission.

Powers to Manufacture

The House accepted the first part of a Government amendment which provides that the Commission shall not have power directly or indirectly to construct or manufacture anything which is not required for use for the purposes of their undertaking or for the fulfilment of a contract made before the acquisition by the Commission of the undertaking.

Lord Addison withdrew the second part of the amendment, dealing with the manufacture of chassis for road vehicles in certain circumstances, with a view to its being revised. Lord Brabazon withdrew his amendment and other amendments were not moved.

Lord Balfour of Burleigh wanted to know on what kind of occasions powers of directing transport in national emergencies would be used and how far they would extend.

Lord Addison said he could give an unqualified assurance that the powers would be used sparingly, and instanced a possible coal crisis during which coal might have priority of movement.

Lord Burleigh who had tabled an amendment to define these powers, then withdrew the amendment.

The House again went into Committee on Tuesday, June 10, when Viscount Swinton moved an amendment that any direction the Minister gave to the Commission must be subject to the guiding principle that he would not give directions that would prevent the Commission from paying its way.

Lord Morrison said the amendment sought to prevent the Minister from doing something which he would not be competent to do.

Viscount Addison said that it was unreasonable of the Opposition to use its large majority in this way.

The amendment was carried by 87 votes to 21.

Lord Balfour of Burleigh moved to delete the subsection which stated that in framing programmes of reorganisation or development involving substantial outlay on capital account, the Commission should act on lines settled from time to time with the approval of the Minister. He said that this afforded the Minister the opportunity of quite unnecessary intervention.

Lord Morrison said that Lord Balfour of Burleigh would not expect that he or any one else could produce a detailed plan. This Bill was part of the national policy which was begun by the last Government—the policy of full employment.

The amendment was negatived.

Lord Balfour of Burleigh moved the first of a series of amendments which, he said, would help the Government to make the scheme work. The British Transport Commission could not be set up until after the Bill had become an Act. It had quite a number of things to do and then had to set up its executives. The basic plan was to get rid of these functional executives and to enable temporary arrangements to be made.

The Earl of Dudley said that the tradition and spirit of the main-line railways had been built up over more than 100 years by the team which had ruled the railways during that period. That spirit was going to be upset to some extent on vesting day.

Viscount Addison said that there was no question of jettisoning the whole body of experience. To suggest that he should produce a plan—which it was the business of the Commission to produce—long in advance of their establishment was unreasonable.

Lord Balfour of Burleigh quoted a statement made by the Chancellor of the Exchequer that the railways were a disgrace to the country. Rather than introduce this harsh Bill it would have been better to allow the railways to get on with first things first, and to restore their efficiency.

The amendment was negatived.

Viscount Swinton moved an amendment which sought to transfer to the Commission the powers to appoint executives. The Government had set up a machine without knowing what the machine was going to do.

Viscount Addison said the Minister thought that as he had the responsibility to Parliament for the success or otherwise of this great enterprise, he should take the responsibility of making the appointments.

The Marquess of Salisbury said that the appointment of the executives was just one of those things that must be left to the Commission. Surely the Government of the day could trust these men to appoint their own executives, which had been done by the Coal Board and in the Civil Aviation Bill.

Viscount Addison said the Government's view was that, in view of the full responsibility of the Minister to Parliament, they ought not to interpose this buffer.

The amendment was carried by 76 votes to 20.

Viscount Swinton moved an amendment to omit "Docks" from the Docks and Inland Waterways Executive.

Viscount Addison could not agree to leaving docks out of the Bill, as they were an integral and important part of the transport system.

Goods-Handling Developments on the G.W.R.

Exhibition of new containers, goods shed equipment, and road vehicles at Westbourne Park

The introduction of two new types of container for bulk traffic on the G.W.R. was made the occasion of a demonstration at Westbourne Park on June 4 of the methods being adopted by the company for facilitating the handling of goods, and expediting their delivery.

One of the new containers is a covered weatherproof design of 3½ tons capacity for the conveyance of cement, lime, china clay, and similar traffics. A current example of its use is for the transport of cement to the new Rhayader Dam. The cement is loaded direct into the containers by the contractors, and discharged therefrom on the site, with great economy in time compared with the handling of the material in bags, and freedom from deterioration due to weather. The containers are of 3½ tons capacity, with gravity discharge. Three can be carried in one open wagon.

A demonstration was given of discharging a covered container into a Bedford-Scammell articulated vehicle fitted with hydraulic tipping gear. The container was lifted from the wagon by means of a Coles 6-ton Utility crane, and the contents were discharged in 1¾ min. An open container of similar capacity is used for the transport of traffics not requiring protection from the weather, such as roadstone, gravel, and sand. In the course of the demonstration a load of 3½ tons was discharged on to a road vehicle in 2¼ min. This container is constructed in two portions, hinged at the top, and is lowered on to the floor of the road vehicle before its contents are emptied by swinging the hinged sections apart. Both the covered and open types have been designed by the Chief Mechanical Engineer's Department.

The G.W.R. uses also a collapsible container of light construction, consisting of a steel frame with netting sides, for handling the regular flow of empty crates from markets. It can be erected in 2¼ min. Two of the containers loaded, or six empty, can be accommodated in an open wagon. The capacity loaded is 1 ton. Using a mobile crane, a container with 120 fish boxes was loaded into a wagon in 2 min.

Several demonstrations were given of the capabilities of the Coventry-Climax fork truck, which was shown unloading drums from a wagon in batches of four, weighing 1 ton 4 cwt., and stacking them in the manner required in a warehouse. The pallet used was 48 in. square. By fitting extensions to the forks and using a special type of pallet, the truck was used to load a motorcar on to a flat wagon. A crane attachment can be fitted in as little time as 1½ min.

A demonstration was given of unloading a coil of cable weighing 1½ cwt. from the interior of a box wagon with this equipment. The fork truck is highly manœuvrable and will turn in its own axis. All the operations of picking up, transporting, and stacking goods are controlled by one man.

The wagons used in connection with these demonstrations were propelled into position by means of a new type of one-man shunting unit, of Belgian manufacture, now in trial service on the G.W.R. The unit is petrol-driven, and provided with a grooved rubber-tyred wheel which runs along the rail when necessary. The operator walks behind, controlling the motor and the adjustable pushing head by means of levers on the handlebars which form part of the tubular-steel frame. Rakes of wagons of up to 150 tons can be propelled, but the fuel consumption of the 10-h.p. engine is only from ¼ to ½ gal. per hr. This unit has many possibilities for economical shunting in small goods yards and private sidings.

A Scott elevating electric platform truck was shown handling a stillage with a 1-ton load, picking it up and elevating it sufficiently for transport, in 2½ sec. Another electric vehicle in use by the G.W.R. is the Douglas electric van, which gave a brief demonstration of its ease of manœuvre and simplicity of operation. In addition to the Bedford-Scammell vehicle used for handling the containers, the exhibits included a Thornycroft dual-purpose unit which can be converted readily for use in an articulated vehicle combination, or as a separate tractor. Among other exhibits were Coles and Ransomes & Rapier petrol-electric mobile cranes, and a Wolseley loading elevator, which has been introduced for the economical loading of sugar-beet traffic. The demonstrations concluded by exhibiting a "Titan C" trailer of 25 tons capacity, coupled to a Foden tractor. A hand winch is fitted on the trailer for loading purposes.

Luncheon at Paddington

Guests who had attended the demonstration were entertained to luncheon afterwards at the Royal Hotel, Paddington. The G.W.R. was represented by the following:—

Mr. David Blee, Chief Goods Manager; Mr. G. Cornish, Principal Assistant to Chief Goods Manager; Mr. T. H. Hollingsworth, General & Staff Assistant to Chief Goods Manager; Mr. H. H. Starr, Road Transport Controller; Mr. A. E. C. Dent, Road Motor Engineer; and Mr. E. Havers, Assistant Development Agent.

Mr. David Blee, who presided, said that in the opinion of the G.W.R. the containers which had been demonstrated provided the answer to a long-standing problem. Eighty more of the cement containers were on order, and were being delivered at the rate of 10 a month. In practice, these containers were being loaded with cement at the contractor's works, and after conveyance by the G.W.R. dumped their contents into hoppers and magazines at the site of the new Rhayader Dam.

The task of unloading railway wagons by hand was well out of date. They believed their very simple roadstone container provided an answer, and that it would serve as well for tarred as for dry stone. This container could cause no damage to the road vehicle because it was set down on the bed of the vehicle before being discharged.

Railways carried some of practically every known commodity, and handling was becoming increasingly expensive as wages rose. The G.W.R. was marching ahead of the times so as to provide industry with service at the price it wanted. Mr. Blee concluded by observing that the G.W.R. operated one of the largest fleets of road vehicles in the country, and he also extended a very cordial welcome to Sir John Thornycroft.

A discussion followed, in which representatives of firms and associations expressed their views on the application of the containers to their particular needs. At the close, Mr. G. Cornish, Principal Assistant to the Chief Goods Manager, expressed the hope that contractors would collaborate with the G.W.R. in developing the use of containers for specific requirements. Mr. A. E. C. Dent, Road Motor Engineer, said that his department made every effort to keep ahead of the needs of industry.

G.W.R. Developments in Maintenance Equipment—8*

Motor scythe with facilities for operating a hedge-trimmer

The Allen motor scythe, illustrated, is easy to handle, having two controls only, clutch and throttle, and these machines are much used on the G.W.R. during the grass-cutting season. The petrol motor drives the wheels as well as the cutters, so that the machine can be operated on

the slopes of embankments and cuttings without undue exertion. The manufacturer, John Allen & Sons (Oxford) Limited, Cowley, Oxford, claims that under average conditions one acre can be scythed in two hours.

By removing the cutting arm and substituting a metal plate, the machine can be used for clearing snow from paths and roads. An electric generator can be obtained which is attached to the machine and driven off the motor, the current being used to operate a hedge-trimmer.

A spraying pump attachment is also available, operated by the lever which works the cutting mechanism. The pump is easily fitted in place of the latter after its removal.

Renaming of Ticehurst Road Station.—Ticehurst Road Station, on the Tonbridge-Hastings line of the Southern Railway, was renamed Stonegate on June 16. This station is 3½ miles from Ticehurst, and much inconvenience has been caused to passengers who have alighted there, as the bus service to the village makes connection with the railway at Wadhurst. The nameboards at Wadhurst Station have been amended to read "alight here for Ticehurst."

* Previous articles in this series appeared in our issues of April 4, April 25, May 2, May 9, May 16, May 23, and June 6

Beyer Peacock & Co. Ltd.

The annual general meeting of Beyer Peacock & Co. Ltd. was held at the Park Lane Hotel, Piccadilly, London, W.1, on Tuesday, June 10. Captain Hugh Vivian, M.I.Mech.E., Chairman of the company, presided.

The Chairman, in the course of his statement circulated with the report and accounts, referred to the recent death of Sir F. Stanley Jackson, who had served the company for many years and would be greatly missed by his colleagues on the board. In his place, the directors had invited Mr. L. T. Dawes, who had been Secretary of the company for 13 years, to join the board.

The net profit for the year was £42,351, an increase of nearly £18,000 compared with the figure for 1945. This increase was due mainly to the taxation relief consequent on the reduced rate of E.P.T. ruling during 1946.

Treasury consent had been obtained in August last to an issue of 300,000 ordinary shares of £1 each and these had been offered to existing ordinary shareholders on the basis of one new share for every existing share held. The issue had been oversubscribed considerably. The additional funds provided had been applied to the extent of £100,000 in redeeming all outstanding debentures of the company. A certain amount of the new money would be utilised for the purchase of machinery and equipment, and the balance would form additional working capital.

Preference Dividend

The arrears of preference dividend had been completely overtaken. When payment of preference dividends had been resumed in 1940, the arrears covered a period of nine years. The rate of dividend payments had been progressive despite many difficulties.

The company's liability in respect of taxation had not yet been finally agreed with the inland revenue authorities, and therefore it would be imprudent to take credit for Excess Profits Tax post-war refund. The effect of E.P.T. legislation on the locomotive industry generally, and on the company in particular, had been very severe.

Due to the reduction of the rate of E.P.T. to 60 per cent. during the year under review, the net profit for the year had been increased considerably. The Chancellor of the Exchequer in his recent Budget speech to some extent had recognised the claims of industry by his new proposals. The proposed taxation modifications should assist in the further consolidation of the financial structure of the company.

Due to the exigencies of the war, delay in renewals of plant and equipment had been inevitable. It was anticipated that in the near future, certain essential new modern machine tools and special equipment urgently required at the factory would be available, and could be acquired, to ensure that the manufacturing facilities of the company as a whole were maintained in first class condition to meet all reasonable production demands.

Under present conditions, an increasing order book brought many new and difficult problems to the management. The flexibility of the organisation, however, had enabled a reasonable level of output to be achieved during 1946—within the restrictions inevitably placed on the factory due to limitation of suitable skilled employees and material supplies. Transport problems involving intermittent embargoes on the transit of certain raw materials and the like presented further problems and, to some extent, retarded efforts to secure adequate supplies of materials on due dates.

The fuel crisis in February had an adverse effect on production. Due to improvisation, the actual production lost had been considerably less than had been envisaged when the standstill order was imposed.

The company's current order book included engines and tenders for the Turkish State Railways, engines and tenders for the Great Northern Railway of Ireland, Beyer-Garratt locomotives for Rhodesia Railways and Beyer-Garratt locomotives for the India Store Department, in addition to which it had other Beyer-Garratt locomotives for Kenya, Uganda, Brazil, and further repeat orders for engines and tenders for Peru, Gold Coast, and tank locomotives for Leopoldina and Ireland.

The extent of the order book was of such proportions that the manufacturing facilities of the company should be fully employed for a considerable time ahead. There still remained throughout the world an unfulfilled demand for steam locomotives and inquiries continued from customers in various countries overseas. The reputation of the Beyer-Garratt locomotive has been further enhanced in recent years, and latest designs of this type of locomotive had solved many traffic problems where alternative forms of motive power would have involved much heavier capital expenditure.

Information reached him from many quarters that the products of the company, all over the world, continued to enjoy the reputation for excellence of design and quality of materials and workmanship. Current service reports received from customers throughout the railway world also bore witness to that.

During the year the company made a substantial contribution to the volume of exports of this country by deliveries of locomotives mainly to South Africa and the South American continent. The locomotives for the South African Railways were large Beyer-Garratt type articulated locomotives of the class "GEA." A number of these had been used during the visit of the Royal Family to South Africa in hauling the Royal Train over the most difficult sections of the line, a duty which was outside the scope of the largest ordinary-type locomotives. During the visit of Their Majesties to Rhodesia, the Royal Train was hauled by the 15th Class Beyer-Garratt locomotives manufactured in Gorton Works, and these latter type engines had given such satisfaction to the railway authorities that the company has been entrusted with further large orders for locomotives of the same design.

A Record Performance

The more modern articulated locomotives had continued to give the service expected of them. In Rhodesia the 15th Class, by averaging over 6,000 miles a month for six years, had created a record for narrow-gauge performance. These locomotives, in some cases, have completed no less than 250,000 miles before general repairs.

The majority of the heavy Beyer-Garratts, Class "GEA" had been delivered for service on the South African Railways, and under test these locomotives had met most successfully the exacting conditions. Both in Burma and on the Bengal-Assam Railway the three types of Beyer-Garratt locomotives manufactured during the war had provided the backbone of the heavy-grade work on the railways in these areas.

Particular attention had been given by the company to the design of details with the object of improving the locomotive from the point of view of reliability, availability, and ease of maintenance. As an example of the attention given to the design of details, he quoted the new patent steam reversing gear, which had been under severe test, and excellent reports were being received bearing out the claim that it overcomes the deficiencies of previous types.

Overseas Visits

The locomotive business of the company was almost exclusively drawn from markets overseas, and it was the policy of the board that senior officers of the company should visit customers from time to time to survey possibilities of future business and to give technical service in respect of the company's products operating overseas. In conformity with this policy, since the last general meeting, visits had been paid to Brazil, Bolivia, Chile, South Africa, Rhodesia, Portuguese East Africa, Kenya, the Sudan, Egypt, India, Ceylon, Burma, the Malay States, Portugal, France, Germany, and the United States of America, and at the present moment, the Sales Director, Mr. W. Cyril Williams was in Australia, where important matters of railway policy were under discussion by the Federal Authorities.

For a number of years the demand for tractive effort in one form or another was likely to exceed the capacity of producing facilities. In this country the restrictions in the allocation of coal, steel, power, and the inevitable shortages of skilled labour, prevented any spectacular increase in locomotive production to meet the unprecedented demands. The production of Gorton Factory, with its present facilities, could be considerably increased, were it possible freely to acquire the necessary materials and consequential additions to the skilled labour forces. The production programmes of the company for some time had had to be limited by reason of these over-riding shortages.

The directors were not unaware of developments which had taken place, and others which were taking or about to take place, in the application of tractive effort to the railway transportation problem, and the technical officers of the company were following with the closest attention the possibilities of exploiting forms of power other than steam.

The report and accounts were adopted and the meeting approved the directors' recommendation of a dividend of 5 per cent.

Bristol Aircraft With Canadian Pacific Airlines.—A Bristol Freighter aircraft has completed recently a period of charter service with Canadian Pacific Airlines. It was employed in flying freight and mail from Seven Islands and Mont Joli to Knob Lake, on the Chicago-Labrador border, where there are newly-discovered iron-ore deposits. The distance from Seven Islands was 320 miles, and from Mont Joli 534 miles. There were no refuelling facilities at Knob Lake, necessitating the carriage of petrol for the return trip *plus* an adequate reserve. During its service, the aircraft carried 250 tons of freight and 9,000 lb. of mail; and also retrieved parts of a crashed Anson aircraft.

Notes and News

"Keep Death off the Track."—A new series of posters has been produced by the L.M.S.R. with the object of stimulating the interest of its permanent way staff in accident prevention. The posters demonstrate by everyday railway scenes the common and dangerous mistakes liable to be made by railway workers.

Locomotive Draughtsman Required.—A locomotive draughtsman is required by the Iraqi State Railways for a tour of three years in the first instance. Candidates must have served an apprenticeship in the workshop of a British railway or firm of locomotive builders, and have a good knowledge of modern steam locomotive design and construction. See Official Notices on page 635.

Works Manager Required.—A works manager (deputy-chief mechanical engineer (works)) is required by the Iraqi State Railways for 2 years in the first instance. Candidates must hold an engineering degree and/or be corporate members of the Institution of Mechanical Engineers, and have had first class experience as a works manager, preferably with a British railway. See Official Notices on page 635.

Dorman Long (Africa) Limited.—This firm, which is a subsidiary of Dorman Long, Middlesbrough, has been appointed main contractor for the structural design and execution of the whole of the steel buildings for the new South African steelworks at Vereeniging, Transvaal. The contract comprises at least 45,000 tons of structural steelwork to a value exceeding £3,000,000, and is the largest overseas contract secured by British structural engineers since before the war. Dorman Long (Africa) Limited also has carried through extensive wagon-building programmes for the South African Railways & Harbours.

Welding Copper Bonds to Rails.—A demonstration of the oxyacetylene method of welding copper bonds to rails was held recently at the Prescot works of British Insulated Callender's Cables Limited. The demonstration included the welding to 95-lb. running rail of two types of rail bonds, each of 0·35 sq. in. cross-sectional area, which were later subjected to a microscopic examination and to hardness and electrical tests. Present at the demonstration, which is illustrated in the photograph reproduced below, were Mr. C. M. Cock, Chief Electrical Engineer, Southern Railway; Mr. R. J. Harvey, Consulting Engineer; Mr. H. J. Stone, Home Sales Manager, B.I. Callender's Cables Limited; and Mr. J. L. Harvey, General Works Manager, Prescot.

Chloride Electrical Storage Company: London Sales Depot.—The London sales depot of the Chloride Electrical Storage Co. Ltd.—evacuated to Richmond since early in the war—has now been established at Whitfield House, 6-10, Whitfield Street, Tottenham Court Road, London, W.1 (telephone: Museum 1616).

Administrative Assistant Required for the Gold Coast.—An administrative assistant, age 25 to 35 years, is required by the Government of the Gold Coast for the railway department for two tours of 18 to 24 months with possible permanency. Candidates must have a good general knowledge of railway and harbour working, including office procedure, accounting and statistics, with preferably some experience in the head office of a home railway. See Official Notices on page 635.

Clyde Trials of L.N.E.R. Paddle Steamer.—Successful trials were carried out in the Firth of Clyde on June 5 of the new paddle steamer *Waverley* with which the L.N.E.R. is replacing a former vessel sunk at Dunkirk. A feature of the accommodation of the new steamer, which has been designed to carry some 1,350 passengers in comfort, is the observation saloon on the upper deck. The firm of A. & J. Inglis Limited, Glasgow, built the new vessel, and Rankin & Blackmore Limited, Greenock, supplied and installed the machinery.

Birmingham & Midland Motor Omnibus Co. Ltd.—Alluding to the manner in which the company was spending large sums of money on future developments, Mr. J. S. Wills, Chairman of the Birmingham & Midland Motor Omnibus Co. Ltd., said that they did not expect any recognition from their Socialist masters, who were apt to look on private enterprise rather as the Devil looked upon Holy water. It was genuinely difficult for men who had spent the whole of their business lives in public service to take a completely monetary or profit-making view. Altogether, they had entered into commitments totalling £2,250,000, and the board was continuing to pursue a normal commercial policy, regardless of the implications of the Transport Bill. During the year there had been much extension of co-ordinated services with municipal transport operators and the main-line railways.

Day Service to Hook of Holland.—The L.N.E.R. announces that in co-operation with the Zeeland Steamship Company, a day service between Harwich and the Hook of Holland will begin with a sailing from Harwich on June 14. The service will operate three times a week in each

Welding Copper Bonds to Rails

Mr. C. M. Cock, Chief Electrical Engineer, Southern Railway, tests the strength of a weld at the works of B. I. Callender's Cables Limited (see paragraph above)

British and Irish Railway Stocks and Shares

Stocks	Highest 1946	Lowest 1946	Prices June 10, 1947	Rise Fall
G.W.R.				
Cons. Ord.	61½	54½	55	—
5% Con. Pref. ...	126½	107	118½	—
5% Red. Pref. (1950)	106½	102½	103½	— 1
5% Rt. Charge ...	140½	122½	133½	—
5% Cons. Guar. ...	137½	118½	129½	— 1
4% Deb.	129½	106	122	— 1½
4½% Deb.	129½	107	122½	— 2
4½% Deb.	130½	114	124½	— 1
5% Deb.	142½	125	135½	— 2
2½% Deb.	95½	81½	92½	—
L.M.S.R.				
Ord.	30½	26½	27½	—
4% Pref. (1923) ...	64	52½	58	— ½
4% Pref.	86	75½	79½	—
5% Red. Pref. (1955)	105½	97	98½xd	— 2
4% Guar.	108½	100	102	— ½
4% Deb.	120	103	112xd	— 1½
5% Red. Deb. (1952)	108½	105½	104½	—
L.N.E.R.				
5% Pref. Ord. ...	7	5	6½	—
Def. Ord.	3½	2½	3½	—
4% First Pref. ...	59½	50½	54½	—
4% Second Pref. ...	29½	25½	27½	—
5% Red. Pref. (1955)	104	97	98½	—
4% First Guar. ...	107	98	101	—
4% Second Guar. ...	101	90	94½	—
3% Deb.	104	87½	97xd	— 1
4% Deb.	119½	102½	111½xd	— 2
4½% Sinking Fund Red. Deb.	107½	101½	101½xd	— 2
SOUTHERN				
Pref. Ord.	79½	70	72	—
Def. Ord.	24	19½	22½	—
5% Pref.	125½	107	117½	— 1
5% Red. Pref. (1964)	115½	106½	110½	— 1
5% Guar. Pref. ...	137½	119	129½	— 1
5% Red. Guar. Pref. (1957)	115½	107½	110½	— 1
4% Deb.	129½	105½	121xd	— 2½
5% Deb.	139½	125½	131½xd	— 3
4% Red. Deb. (1962-67)	113½	104½	107½xd	— 3
4% Red. Deb. (1970-80)	115½	104½	108½xd	— 3
FORTH BRIDGE				
4% Deb.	109	103	103½	—
4% Guar.	105	102	99½	—
L.P.T.B.				
4½ "A"	133½	120½	125½xd	—
5% "A"	142½	130½	134½xd	—
3% Guar. (1967-72) ...	108	98½	104½xd	—
5% "B"	128½	117½	120½xd	— 1
"C"	64½	56½	62½	—
MERSEY				
Ord.	34	30	33	—
3% Perp. Pref. ...	76	69	72½	—
4% Perp. Deb. ...	117½	103	111	—
3% Perp. Deb. ...	98	81	92½	—
IRELAND*				
BELFAST & C.D.				
Ord.	8½	6	7½	—
G. NORTHERN				
Ord.	41⅞	30½	30	— 1½
Pref.	63½	52	48	— 2
Guar.	97½	78½	89½	—
Deb.	107	97½	100⅝	— ⅛
IRISH TRANSPORT				
Common	19/2½	16/9	16/-	—
3% Deb.	107	100	104	— 1

* Latest available quotation

OFFICIAL NOTICES

Crown Agents for the Colonies

APPLICATIONS from qualified candidates are invited for the following post:—

ADMINISTRATIVE ASSISTANT required by the Government of the Gold Coast for the Railway Department for two tours of 18 to 24 months, with possible permanency. Salary and overseas pay £600, rising to £970 a year. Commencing salary according to age and war service. Outfit allowance £60. Free passages. Candidates age 25 to 35 must have a good general knowledge of railway and harbour working, including office procedure, accounting and statistics, with, preferably, some experience in the head office of a home railway. They should be capable of drafting letters and reports and have organising ability. Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this paper, to the CROWN AGENTS FOR THE COLONIES, 4, Millbank, London, S.W.1, quoting M/N/18068 on both letter and envelope.

STEEL STRUCTURES purchased, dismantled and removed. Industrial steel structures re-built, re-roofed and renovated. Steel factory buildings dismantled, re-erected or adapted on other sites.—BELLMAN HANGARS LIMITED, Terminal House, Grosvenor Gardens, London, S.W.1. Sloane 5259.

Crown Agents for the Colonies

APPLICATIONS from qualified candidates are invited for the following post:—

WORKS MANAGER (Deputy Chief Mechanical Engineer (Works)) required by the Iraqi State Railways for 2 years in the first instance. Salary between Iraq Dinars 120 and 130 a month, according to qualifications and experience, plus a high cost-of-living allowance of I.D. 24 a month (I.D. 1 = £1). Free passages. Provident fund. Candidates must hold an Engineering Degree and/or be Corporate Members of the Institution of Mechanical Engineers and have had first class experience as a Works Manager, preferably with a British Railway. They must have a full knowledge of jigs and tool fixtures and of the speeds and feeds of machine tools and be capable of introducing the most up-to-date methods of production and progress planning. A knowledge of Diesel locomotives is desirable. Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this paper, to the CROWN AGENTS FOR THE COLONIES, 4, Millbank, London, S.W.1, quoting M/N/12840 on both letter and envelope.

PLASTICS IN RAILWAY ENGINEERING. By T. Lovatt Williams and D. Warburton Brown. 1*s*. *By post* 1*s*. 2*d*.

Crown Agents for the Colonies

APPLICATIONS from qualified candidates are invited for the following post:—

LOCOMOTIVE DRAUGHTSMAN required by the Iraqi State Railways for a tour of 3 years in the first instance. Salary, Iraq Dinars 60 a month, plus high cost-of-living allowance of between I.D. 14 and I.D. 18 a month, according to number of dependants. (I.D. 1 = £1.) Free passages. Provident fund. Candidates must have served an apprenticeship in the workshop of a British Railway or firm of Locomotive Builders, and have a good knowledge of modern steam locomotive design and construction. A knowledge of diesel traction would be an advantage. Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this paper, to the CROWN AGENTS FOR THE COLONIES, 4, Millbank, London, S.W.1, quoting M/N/12841 on both letter and envelope.

TRAFFIC CONTROL ON THE L.M.S.R. Co-ordination of operating arrangements as a result of grouping.—Central, Divisional, and District Control—Outline of unified methods adopted—Organisation and working—Control telephone circuits—Daily telephonic conferences. Paper. 12 in. by 9 in. 20 pp. Illustrated. 5*s*. *By post* 5*s*. 2*d*.

direction, leaving Harwich (Parkeston Quay) on Tuesdays, Thursdays, and Saturdays; and the Hook of Holland on Sundays, Wednesdays, and Fridays. Boat trains will leave Liverpool Street Station at 9.20 a.m.

Week-End Closing of St. Pancras for Track Renewals.—The whole of the permanent way for 240 yd. out of St. Pancras, L.M.S.R., is to be renewed by mid-August. The work will involve closing the station to traffic either wholly or partly at six week-ends from June 15 to August. Over 40 sets of points and 50 crossings will be replaced. At the same time signalling will be modernised and the arches carrying the line over the L.M.S.R. stables reinforced.

Institute of Welding Annual Dinner.—The Institute of Welding will hold its annual dinner at Grosvenor House, Park Lane, London, W.1, on June 25 at 7 for 7.15 p.m. Tickets (price 30s. 6d. each, excluding drinks) are now available for distribution to members. Evening dress will be worn with orders and decorations; or dinner jacket. Members who require hotel accommodation are invited to notify the Secretary of the Institute, 2, Buckingham Palace Gardens, London, S.W.1.

Forth Bridge Railway Company.—In order to prepare warrants for interest on the 4 per cent. debenture stock, and dividend on the 4 per cent. ordinary stock of the Forth Bridge Railway Company for the half-year ending June 30, the last date for receiving transfers is June 20 at 5 p.m.

Bletchley, L.M.S.R., Derailment Inquiry.—The inquiry into the derailment of an L.M.S.R. Euston—Manchester express near Bletchley on May 29 (see our June 6 issue) was held on June 5 by Lt.-Colonel E. Woodhouse. The driver of the train stated that he had a clear road through Bletchley, and was travelling at about 60 m.p.h. On rounding a bend he saw that the rails were not set correctly, but were verging two or three inches to the right. He thought there was "a break in the rails or something"; both rails were affected. A ganger gave evidence that he had walked along the section concerned 90 min. before the derailment. Everything then was in perfect order. A sub-inspector who inspected the track shortly after the accident said that for six or seven lengths, immediately in the rear of the first mark of the derailment, the joints were tight up. There were signs of considerable expansion in the track. There was nothing wrong with the track other than what might have happened as a result of heat. In further evidence it was stated that the shade temperature at Woburn agricultural experimental station between 4 p.m. and 5 p.m. on May 29 was 85°. The inquiry was closed.

L.N.E.R. Summer Train Services.—In order to maintain the services coming into operation on June 16 at 10 per cent. below the level of last summer, most of the additional trains in the new timetable will run on Saturdays only. There will be three extra trains on Saturdays from Kings Cross to Leeds and Bradford, one to Skegness, and one to Bridlington, Scarborough, and Filey Camp. New Saturday trains from Liverpool Street will run to Clacton, Yarmouth, Cromer, and Gorleston. On the G.C. section the 12.15 p.m. Marylebone—Manchester and 8.25 a.m. Manchester—Marylebone will be reinstated to run daily.

L.N.E.R. "R.R. News."—The Refreshment Room Services of the L.N.E.R. are issuing a journal of news and general information. In the May issue, a message from Sir Charles Newton wishes success to the publication, and expresses his conviction that in its improved and redecorated refreshment rooms, the company is setting a new and high standard of service to the travelling public. Food supplies may be short, but the L.N.E.R. is showing its customers how the best possible use can be made of such commodities as are available, and Sir Charles Newton looks forward to the time when their refreshment rooms will bear comparison with any other catering establishments in the country. The issue quotes a commendatory reference to the refreshment room at Sheffield Victoria Station which appeared recently in *The Manchester Guardian*, describing the purchase for the price of fourpence of "a very good bowl of soup and a slice of toast."

International Railway Conference in Stockholm

Mr. G. O. V. Dahlbeck, General Manager, Swedish State Railways, speaking at the opening of the International Railway Conference in Stockholm on June 3. On the left is Mr. R. H. Hacker, Continental Superintendent, Southern Railway, and on the right a representative of the French National Railways

Forthcoming Meetings

June 18 (*Wed.*).—The Permanent Way Institution (London Section), visit to the Bell Punch Company's works, Uxbridge.

Railway Stock Market

There have been conflicting currents in stock markets, buyers tending to await international developments, although the undertone was steady with only moderate selling in evidence. The Indian news helped sentiment generally and British Funds strengthened, but later the French railway strike and other European factors made for caution, and moreover there has been a tendency to await any sequel to the suggested U.S. aid to Europe. British Funds, which had rallied after the Indian news turned easier, reflecting a little selling, and among industrials best levels were not held, although in most cases all but a small part of recent gains was held.

Financial results and dividend announcements continue to create an excellent impression, and it is noticeable that since the Budget there has been a considerable increase in the number of companies paying higher dividends. This no doubt arises in part from the fact that because of Mr. Dalton's bonus tax, the cost of bonuses is prohibitive, and in the circumstances, directors feel justified in stepping up dividend payments. Encouraged by this fact leading industrials, such as Imperial Chemical and Dunlop Rubber, have increased their payments. Smaller companies are now distributing higher dividends, but it will be noted that with few exceptions trading profits have increased, and in most cases a substantial proportion of profits continues to be retained in the form of allocations to reserves.

The fear that a cut in dollar imports may be in prospect was given as the reason for an easier tendency in tobacco and cinema shares, and despite the higher dividends recently announced by Shell, Royal Dutch, and V.O.C., oil shares turned dull on suggestions that dollar shortages might lead to a reduction in oil imports. Iron and steel shares were inclined to attract rather more attention in view of the good yields offered by United Steel, Dorman Long, and Thomas & Baldwins, the belief having gained ground that fair compensation in the event of nationalisation would justify higher prices than those now prevailing. Babcock & Wilcox and other engineering shares were helped by official news of the extent that current engineering exports exceed the volume in 1938.

Moreover, locomotive shares have been firm, North British Locomotive and Vulcan Foundry being helped by news of contracts valued at nearly £6,000,000 for railway engines for India.

Home rails again recorded few movements, and some of the debentures and preference shares moved fractionally lower, the fact that prices continue to be well below take-over levels failing to attract investors generally, who appear to have little liking for securities of companies on the brink of nationalisation. Nevertheless, there is still institutional buying of home rails, more particularly debentures and senior preference stocks. Possibly when the interim dividend decisions are due later in the year there may be a revival of activity in the junior stocks. Meanwhile, Great Western at 54¾, compares with a take-over level of 59 1/16, L.M.S.R., is now 27½, compared with take-over of 29½, L.N.E.R. second preference 26, compared with 29¾ take-over, and Southern deferred 22¼, as against the take-over level of 24.

In contrast with the prevailing quietness of home rails, there has been a general rise in shares of road transport companies on hopes that the Government may at the eleventh hour agree to a revised compensation for this section of the transport industry, the suggestion being that the basis may be the value of the assets of the individual companies. Whether the City is correct in this assumption remains to be seen, but there is, of course, a strong case for fair compensation for road transport and bus companies. On the other hand, a comparison of the various nationalisation compensation schemes brought forward by the Government for particular industries, certainly suggests that home railway stockholders have fared the worst.

Argentine railway stocks have been less active, although the senior debentures tended to attract more attention. Nevertheless, the latter are still well below the share-out prices. There has not been a great deal of demand for the ordinary or preference stocks, although in many cases current levels seem particularly attractive in relation to the share-out basis. Buenos Ayres Western 4½ per cent. preference, for instance, is no better than 96½, compared with the share out level of 100, and Buenos Ayres Great Southern 5 per cent. preference at 69¾, is 5¼ below the share-out price.

In other directions, Central Uruguay ordinary have attracted revived speculative attention around 23 on renewed talk of take-over possibilities. Leopoldina and other Brazil rail stocks encountered more profit-taking, prices in most cases losing further ground, although in some quarters it is still being assumed that later in the year Brazil may bring forward a scheme for acquiring the railways.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week ended	Traffic for week: Total this year	Traffic for week: Inc. or dec. compared with 1945/6	No. of Week	Aggregate traffics to date: Totals 1946/7	Aggregate traffics to date: Totals 1945/6	Aggregate traffics to date: Increase or decrease	Shares or Stock	Prices: Highest 1945	Prices: Lowest 1945	Prices: June 10, 1947
				£	£		£	£	£				
South & Central America	Antofagasta	834	16.47	47,950	+ 16,370	22	861,160	723,830	+ 137,330	Ord. Stk.	12	8¾	15½
	Arg. N.E.	753	31.5.47	ps.315,900	+ps.50,200	48	ps.15,396,000	ps.14,142,900	+ps.1,253,100	,,	10	5¾	11
	Bolivar	174	May, 1947	$115,230	+ $20,745	22	$564,878	$559,135	+ $5,743	6 p.c. Deb.	8½	5½	16½
	Brazil	—	—	—	—	—	—	—	—	Bonds	25	17	34
	B.A. Pacific	2,771	31.5.47	ps.2,450,000	+ps.567,000	48	ps.116,627,000	ps.109,531,000	+ps.7,096,000	Ord. Stk.	7	5	11¼
	B.A.G.S.	5,080	31.5.47	ps.3,696,000	+ps.896,000	48	ps.174,708,000	ps.170,793,000	+ ps.3,915,000	Ord. Stk.	13¾	10½	18
	B.A. Western	1,924	31.5.47	ps.1,569,000	+ps.299,000	48	ps.63,939,000	ps.57,961,000	+ ps.5,978,000	,,	12¾	9½	23½
	Cent. Argentine	3,700	31.5.47	ps.3,121,900	+ps. 5,800	48	ps.154,674,480	ps.151,574,106	+ ps.3,100,374	,,	9¾	7	19
	Do.	—	—	—	—	—	—	—	—	Dfd.	5	2⅞	14
	Cent. Uruguay	970	31.5.47	12,035	− 27,532	48	1,742,300	1,918,964	− 176,664	Ord. Stk.	7¼	4	22½
	Costa Rica	262	Mar., 1947	32,528	+ 1,760	39	252,900	252,872	+ 28	Stk.	16½	13	12
	Dorada	70	Apr., 1947	29,700	+ 400	17	119,200	115,275	+ 3,925	1 Mt. Deb.	103	102	106½
	Entre Rios	808	31.5.47	ps.396,300	− ps. 900	48	ps.20,546,200	ps.20,346,700	+ ps.199,500	Ord. Stk.	7½	4¾	11
	G.W. of Brazil	1,030	31.5.47	25,700	+ 2,300	22	751,900	637,300	+ 114,600	Ord. Stk.	30/-	23/6	4¼
	Inter. Ctl. Amer.	794	Apr., 1947	$1,158,970	+ $195,190	17	$4,750,346	$3,878,475	+ $871,871	—	—	—	—
	La Guaira	22¾	Apr., 1947	$101,968	− $11,228	17	$457,043	$460,888	− $3,845	5 p.c. Deb.	78	70	85½
	Leopoldina	1,9 8	31.5.47	60,076	+ 7,104	22	1,386,351	1,209,285	+ 177,066	Ord. Stk.	4¼	3¼	15
	Mexican	483	31.5.46	ps.1,464,000	+ps.459,100	22	ps.7,706,200	ps.13,441,600	+ ps.5,220,200	Ord. Stk.	¼	¼	¼
	Midland Uruguay	319	Apr., 1947	17,503	+ 343	43	167,262	181,451	− 14,189	—	—	—	—
	Nitrate	382	31.5.47	10,997	+ 746	22	91,182	93,282	− 2,100	Ord. Sh.	75/6	67/6	83/9
	N.W. of Uruguay	113	Apr., 1947	4,477	− 657	44	53,910	54,5.7	− 597	—	—	—	—
	Paraguay Cent.	274	30.5.47	G68,540	+ G15,455	48	G3,024,850	G2,911,379	+ G113,471	Pr.Li.Stk.	79½	77	60½
	Peru Corp.	1,059	May, 1947	158,756	+ 22,668	48	1,676,971	1,538,021	+ 138,950	Pref.	10⅜	7¾	10
	Salvador	100	Mar., 1947	c209,000	+ c34,000	39	c1,338,000	c1,255,000	+ c83,000	—	—	—	—
	San Paulo	153½	—	—	—	—	—	—	—	Ord. Stk.	60¾	50½	182½
	Taltal	156	.May, 1947	3,700	− 95	48	44,715	36,995	+ 7,720	Ord. Sh.	17/-	10/6	20/-
	United of Havana	1,301	31.5.47	100.522	+ 40,945	48	3,332,786	2,908,958	+ 423,828	Ord. Stk.	3	1	3
	Uruguay Northern	73	Apr., 1947	1,438	− 145	43	12,767	17,350	− 4,583	—	—	—	—
Canada	Canadian National	23,535	Apr., 1947	9,004,750	+1,152,000	17	34,073,750	30,942,500	+ 3,131,250	—	—	—	—
	Canadian Pacific	17,037	31.5.47	2,248,250	+ 381,250	22	31,090,000	29,074,500	+ 2,015,500	Ord. Stk.	24	14⅜	16¼
Various	Barsi Light†	202	Mar., 1947	26,032	+ 3,375	52	271,575	272,272	− 697	Ord. Stk.	131	123	111½
	Beira	204	Mar., 1947	97,709	+ 16,983	25	543,949	352,628	+ 191,321	—	—	—	—
	Egyptian Delta	607	10.5.47	16,831	+ 546	6	67,112	64,905	+ 2,207	Prf. Sh.	10	8¼	6½
	Manila	—	—	—	—	—	—	—	—	B. Deb.	71	55½	70
	Mid. of W. Australia	277	Apr., 1947	18,404	− 1,260	39	167,312	172,148	− 4,836	Inc. Deb.	97½	85	65
	Nigeria	1,900	Mar., 1947	447,385	− 28,271	52	4,645,226	3,636,760	+ 1,008,466	—	—	—	—
	Rhodesia	2,445	Mar., 1947	530,935	+ 12,797	25	3,292,108	2,994,202	+ 297,906	—	—	—	—
	South African	13,323	10.5.47	1,269,511	+ 149,369	6	7,085,490	6,322,050	+ 763,440	—	—	—	—
	Victoria	4,774	Jan., 1947	1,314,795	+ 110,075	30	—	—	—	—	—	—	—

† Receipts are calculated @ 1s. 6d. to the rupee